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The NEW ZEALAND JOURNAL OF AGRICULTURE

Vol. 66. WELLINGTON, FEBRUARY 15, 1943. No. 2.

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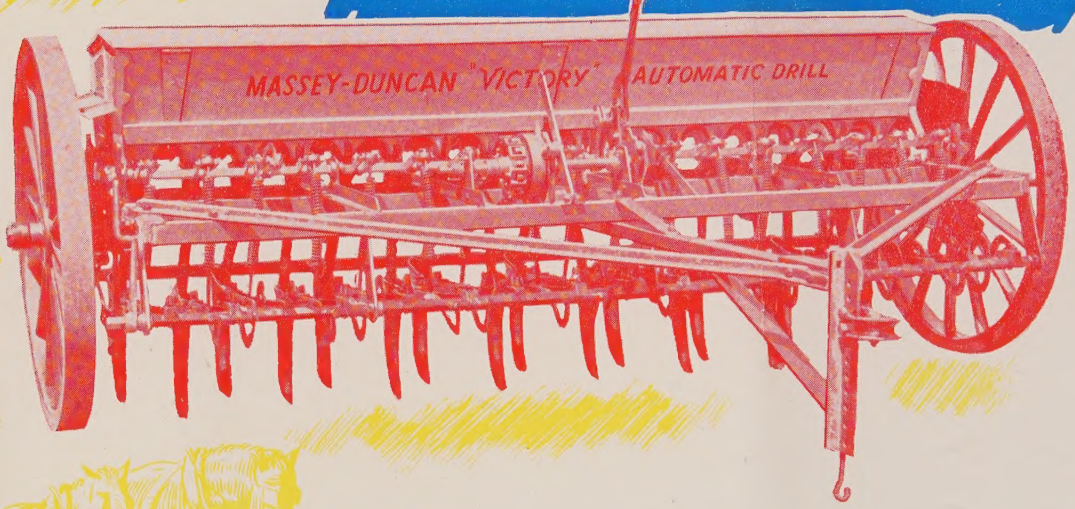

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THE NEW ZEALAND
JOURNAL OF AGRICULTURE
Vol. 66. No. 2.
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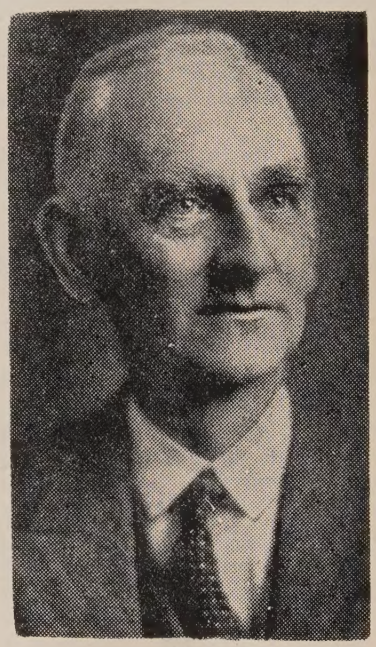
Retirement of Mr. A. H. COCKAYNE

NEW ZEALAND has had many distinguished public servants, but it is doubtful whether any have had such a marked influence on the Dominion's development as Mr. A. H. Cockayne, I.S.O., who has retired from the position of Director-General of the Department of Agriculture.

A son of the late Dr. Leonard Cockayne, famous botanist and ecologist, Mr. A. H. Cockayne was born in Christchurch in 1880 and joined the Department of Agriculture in 1904 as assistant biologist. Mr. Cockayne received a thorough training in botanical and natural science under the tuition of his father, and at Canterbury College. His natural aptitude for animal and plant biology, and appreciation of all phases of plants and their growth was so outstanding that in 1909 he was appointed biologist to the Department. In this capacity Mr. Cockayne built up a biological staff which served the Dominion with credit and paved the way to making the investigation of pasture grasses and clovers the exact science it has become in this country. In 1923 he was appointed Director of the fields Division and in that capacity developed one of the States most useful services which has done so much in carrying out experimental and extension work among the farmers of New Zealand. In 1929 he became Assistant Director-General and on the retirement of Dr. Reakes in 1936 was appointed Director-General.

Although his interests and activities have been directed at all times to the improvement of agriculture, Mr. Cockayne, when the history of the development of New Zealand is written, will probably be best remembered as one of the founders of modern grassland farming which has contributed so much to the wealth of this Dominion. Early in his public career he quickly visualised the enormous possibilities in the utilisation of good strains of grasses and clovers coupled with the judicious use of topdressing, and throughout his life he has been a consistent advocate for the improvement of our grasslands. A man with an essentially practical outlook he realised that New Zealand must depend for its economic existence primarily on the products of livestock grazing, and his aim and object has even been directed to the improvement of livestock, and the pastures on which they thrive.

At all times keen to acquire knowledge, he derived much profit from various visits to America, England, and Australia, and in these countries he was acclaimed in scientific circles as one of the foremost agricultural workers in the Empire.



[*S. P. Andrew, Photo.*

Mr. A. H. Cockayne, I.S.O.

Never an egotist but always a realist, Mr. Cockayne had a critical faculty almost amounting to inspiration, and many of our leading research workers in the Dominion owe their standing and success to the guidance and help so freely given at all times by one who had the unique gift of being able to inspire. His breadth of knowledge was a byword to those who knew him, and his wealth of detailed information in all aspects of primary production was a revelation to his associates. His ability immediately to get to the

heart of a problem and eliminate the wheat from the chaff rendered him an invaluable member of the many organisations over which he presided or upon which he served. In his capacity as a member of the Research Council and as founder and President of the New Zealand Grassland Association he was responsible in a large measure for co-ordinating the activities of the Dominion's research workers and popularising with the farmers the findings of the scientists.

His unorthodoxy was probably his greatest attribute, and having an orderly mind himself his impatience with slovenly ideas was an unspoken whiplash to the careless. One of his outstanding merits was his kindliness and humanity to those needing help, and realising the inevitability of mistakes he showed a tolerance and forbearance which endeared him to his wide circle of friends and fellow-workers.

Although Mr. Cockayne has retired from his official position, his long association with the Department and his direction of its activities will remain a permanent monument to his versatility and leadership. The farmers of the Dominion will regret his retirement but they will have the consolation of knowing that their guide, philosopher, and friend will still remain actively interested in the welfare of the farming of this country.

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J.A. 19

Director-General of Agriculture

Appointment of

MR. E. J. FAWCETT

Mr. E. J. Fawcett, M.A.

THE appointment of Mr. E. J. Fawcett, M.A. (Cantab.) as Director-General of Agriculture was announced recently by the Minister of Agriculture (Hon. J. G. Barclay).

Mr. Fawcett was born at Tadmor, Nelson, in 1892, and was educated at the local primary school. His early life was spent in farming on his father's property. In 1915 he left for the war with the Seventh Reinforcements with the rank of 2nd lieutenant, and served in France until 1917, when he was incapacitated at Passchendaele. After that engagement he was awarded the Military Cross and he was discharged from the Army with the rank of captain in 1918. Shortly afterwards he was awarded a Kitchener Memorial Scholarship tenable for one year, and obtained permission to enter Cambridge University under a special dispensation. On the completion of that year Mr. Fawcett was granted a New Zealand Expeditionary Force Scholarship, and after three years' residence at Cambridge took his B.A., specialising in agricultural science and economics. He completed his M.A. in 1925.

On return to New Zealand in 1922 he was appointed instructor in agriculture, and in the following year was promoted to the position of instructor in charge of the East Coast district. In 1925 he was transferred to the head office of the Department as agricultural economist, and while serving in that capacity carried out a number of investigations and surveys which have been the basis of much valuable work by the Department. He has published many papers on the economics of agriculture and has acted in an advisory capacity on several committees and commissions. In 1934 he served on the secretariat of the Dairy Commission. In 1936 he was promoted to the position of technical liaison officer of the Department and represented it on the Bureau of Industries, the Tobacco Board, and other bodies. In February, 1938, he was appointed Assistant Director-General and has been prominent in all features of agriculture during the war period. In addition to holding the position of chairman of the Flax Rehabilitation Committee, he has been appointed a member of the Supply Council.

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Preserving Soil Fertility

— By —

A. C. S. WRIGHT,
Soil Survey Division,
Department of Scientific and Industrial Research, Wellington.

IN New Zealand, nearly half a million people are directly dependent on the soil for their livelihood; half a million New Zealanders, with their livestock, vitally concerned with the soil and its products. By and large the soil never fails them, but we still hear of cases where careless management of the land has brought its inevitable reward in the shape of poverty and poor health.

This wastage of soil, and human life, and effort should no longer be tolerated. For too long it has been the constant companion of the growth of civilisation; the history books say little about the farmers who strove to wrest a livelihood from unsuitable soil, but the record is preserved for us in the scarred face of the earth. Time and time again the lesson of unwise farming has been demonstrated for us, and though we may understand the fundamental causes of these wasted efforts, we do not spread the knowledge widely enough so that each and every farmer shall come to know his soil in respect of its properties, its potentialities, and its limitations.

True, soil is one of the natural resources of the world that cannot easily be used up, but its fertility, the outcome of hundreds of years of slow building up, can be squandered in a decade. Concurrent with loss of fertility, the very particles themselves may become loosened, and particle by particle the mantle of soil disperses to its final resting place on the bed of the ocean. Thus have highly organised communities found their livelihood swept from under their feet, and the progress of a section of the race is temporarily halted because the farmers failed to appreciate the vital mobility of the soil. This is soil change on a terrible scale, and one which impresses itself deep on the minds of its creators, before they become the victims of their own folly.

Soil Change

New Zealand is a young and fortunate land, and has but few examples of the bad stage of soil deterioration, but because the danger of ultimate devastation seems remote, we are inclined to overlook the more subtle early stages of the process, although they are already a definite drag on the progress of some of our farming districts. The purpose of this article is to bring out the importance to the farmer of knowing his soil, not only its present characteristics and its past history, but how to build it up for a successful future. In other words, to see the soil in its true perspective.

Consider, then, the simplified diagram of soil change. It introduces three fundamental ideas. They are:

1. The idea that the virgin soil is in balance with its natural environment.
2. The idea that when agriculture commences, the first stage in soil deterioration is an often overlooked **soil decline** in (a) soil structure, and (b) plant foods; which is remedied by soil upbuild induced by good farming.
3. The idea that a permanent agricultural soil is a soil in balance with the agricultural environment.

These three ideas underlie the progressive stages in the development of permanent agriculture, and if we examine them in more detail, we can appreciate how the changing soil influences our destiny—of individual or community.

The Virgin Soil

The soil in its virgin state possesses a vegetative cover that retards the loss

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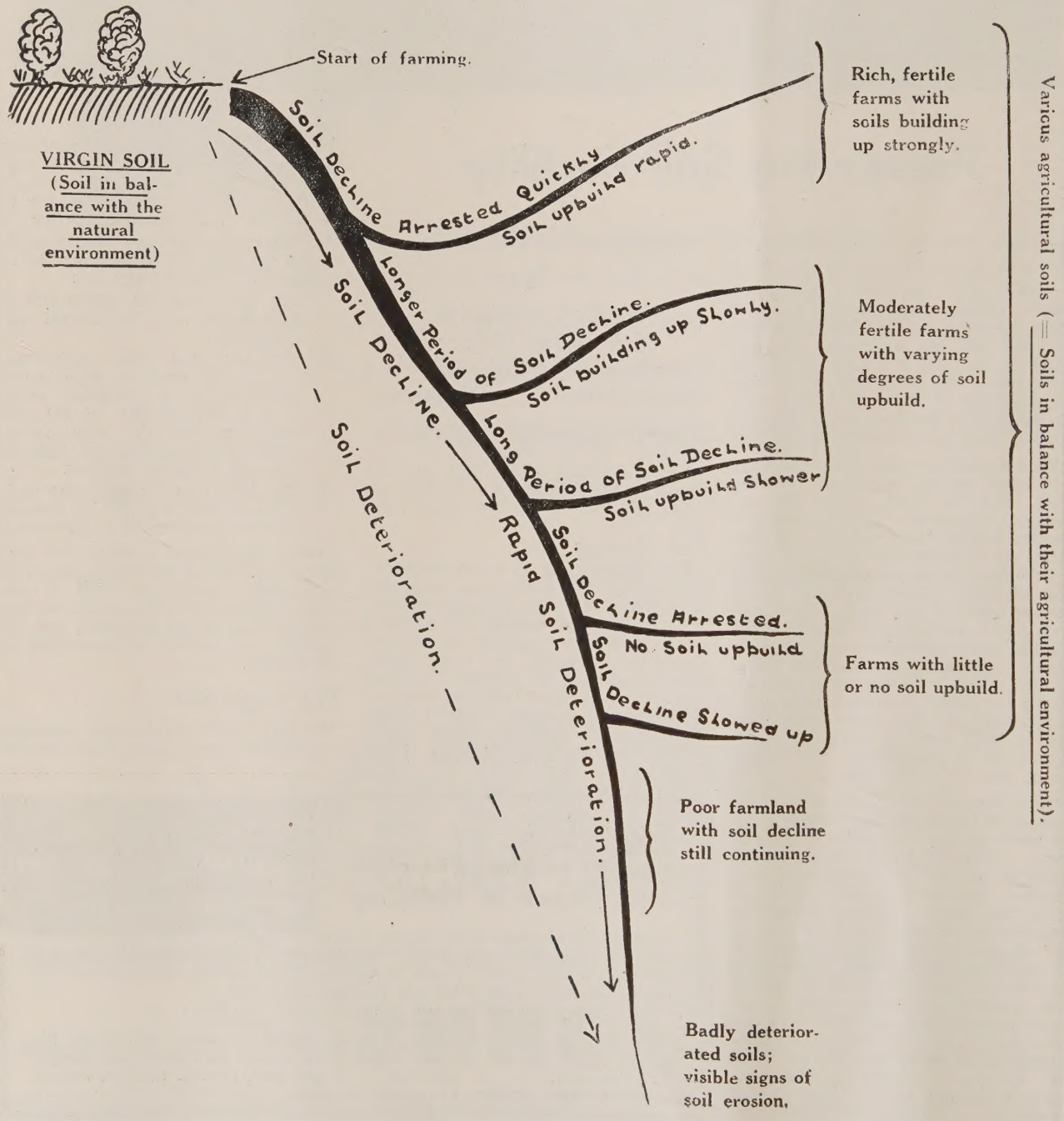
of plant foods; builds up the organic matter in the topsoil; and sews the soil firmly in place with its roots. Falling foliage maintains the mineral matter near the surface, and the roots of the more robust plants range the subsoil and minimise the escape of soluble plant foods. Moreover, the fibrous roots act as a leavening in the soil, promoting good structure, and provides myriads of minute dams that check the movement of rain-water, and reduce loss of soil by surface wash. Under different types of vegetation, different soils are developed, but the above characteristics are common to all types of virgin soil.

Even under natural conditions, however, the soil is capable of great change. We see this in the lowland areas of the South Island, where climatic conditions favoured forest in some parts, and tussock grassland in other parts. The soils under the forest were kept open and crumbly to a considerable depth by the deep tree roots; and plant foods were collected over a wide area of subsoil and built up in the topsoil by the leaf litter. Elsewhere on the plain, the soil supported a grass cover which, with its shallow and more localised root system, did not utilise the subsoil to the same extent as the forest, and differed both in appearance and fertility.

When, for some reason unconnected with the hand of man, the forest edge retreated, and the abandoned area was clothed with tussock, plant foods began to be leached out by percolating rain-water and the soil fertility declined until it reached a level which the tussock was able to maintain. In addition to a change in the plant food content, the upper part of the subsoil


Start of farming.
VIRGIN SOIL
(Soil in balance with the natural environment)
Soil Decline Arrested Quickly
Soil upbuild rapid.
Rich, fertile farms with soils building up strongly.
Longer Period of Soil Decline.
Soil building up Slowly.
Soil Decline.
Moderately fertile farms with varying degrees of soil upbuild.
Long Period of Soil Decline.
Soil upbuild Slower
Rapid Soil Deterioration.
Soil Decline Arrested.
No Soil upbuild
Soil Decline Slowed up
Farms with little or no soil upbuild.
Soil Deterioration.
Poor farmland with soil decline still continuing.
Badly deteriorated soils; visible signs of soil erosion.
Various agricultural soils (= Soils in balance with their agricultural environment).

became compacted after the tree roots vanished, and a tight, hard zone was formed which is recognised by the farmers to-day as a "clay pan." This is an example of soil change under natural conditions, and it leads us to the next consideration, which is, soil change consequent on the start of agriculture.

Start of Agriculture

When a man sets out to replace the natural vegetation with something of more value to the community, he must inevitably alter the environment of the soil, and set in motion a period of soil change. Because the plants which he substitutes for the natural vegetation are usually shallower-rooted forms, or do not form a complete cover, they are less efficient in preserving the plant foods in the soil and soil change expresses itself as a soil decline.

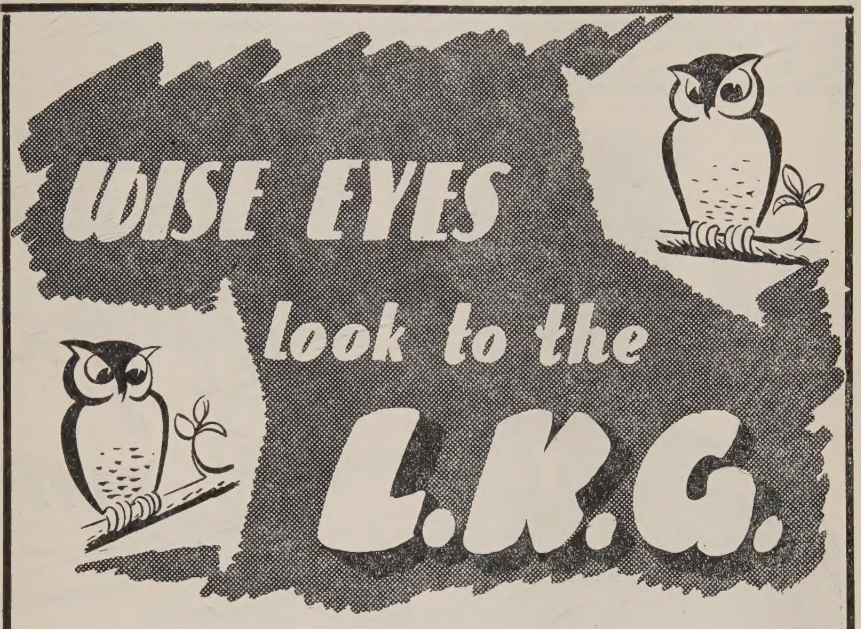
Whether he can arrest the soil decline (loss in fertility) right away, or has a longer struggle before he can stabilise the soil, depends in a large measure on the natural richness of the soil (often determined by the type of rock from which the soil is derived); but even more important are the agricultural factors by which he modifies soil conditions throughout the year. Both the rate and the duration of the soil decline can be greatly affected by proper farm methods.

Soil decline and soil upbuild are terms applicable both to soil fertility (usually used in the sense referring to the chemical status of the soil), and soil structure (the physical status of the soil). Soil fertility and structure are, of course, inter-related factors, but by dealing with them on a separate basis, we can better understand the process of soil decline and upbuild.

The Decline and Upbuild of Soil Structure: When we destroy the natural vegetation, and put in the plough for the first time, a certain amount of working is necessary to obtain "good tilth." "Good tilth" is therefore a temporary loosening of the soil, and with repetitions of this loosening process, the granular structure of the virgin soil is slowly destroyed. Every time an implement is forced through the soil countless granules are crushed, and the particles composing them take up new positions or are forced into the pores between the remaining granules, thus diminishing water movement and aeration.

At first the mass of roots of the former vegetation absorbs part of the stress of the tillage process, and the soil keeps a springy, spongy structure; but when the roots have decomposed, the plant residues from the cultivated crops are too scanty to maintain the porous structure, and the soil becomes compact. Under cultivation, 25 per cent. more soil is crammed into a cubic foot than under the natural vegetation, and in due time the farmer sees this in the shape of pastures invaded by rushes, or land showing an increased tendency to "poach" when stocked in wet weather.

Continual cropping seriously intensifies the breakdown of the granular structure of the soil, and that is what happened in some parts of New Zealand in the early days when cereals were the profitable crop, and grass farming was almost non-existent. Traces of this period of exploitation can be seen in the soils concerned to the present day. When cropping is followed by several years of undisturbed grass, the soil structure undergoes partial recuperation. There is a return to the granular, crumbly structure. Such a structure can be built up in any soil supplied with lime and organic matter; although these two ingredients alone cannot produce the best soil structure which demands, in addition, an undisturbed perennial vegetation. A reasonably good soil structure is essential for free circulation of soil air and soil water. A good structure allows the soil to warm up readily in the spring, and promotes an even distribution of moisture. Recent observations on the growth of linen flax show the importance of a seed-bed that has



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been worked to give good internal structure in order that the seedlings may make a steady, even growth in the early stages.

The Decline and Upbuild of Plant Food in the Soil: Soils vary considerably in productive capacity when first cultivated. The cropping life of some covers but a few years, and in general it is not possible to bring all soils to an equal level of production no matter what methods of soil improvement are resorted to. This is because the soil possesses chemical characteristics which are inherent in the type of soil.

The amount of exploitation which the soils on a farm will tolerate before the production level is reduced depends, in a large measure, on this original amount of plant food in the soil. Every grazing animal, every gallon of milk or bushel of grain sold off the farm, every gallon of water percolating into the subsoil, removes a portion of the never-too-abundant supply of plant food. The situation is aggravated because the tendency under the former cover was for the organic matter, and the elements, phosphorus, potash, lime, and magnesium, to be built up in the topsoil, and it is precisely this layer that carries the burden in arable farming. When the original store of nutrients in the topsoil is depleted, there is a drop in yields.

Some farmers will probably be able to recall the time when their soil reached this stage—before the advent of artificial fertilisers. The practice of top-dressing spread to New Zealand at a most opportune time in the history of its soil decline. If it had not come when it did, it is probable that there would have been no alternative but to alter the type of farming to one with a lower scale production, and which paid greater attention to the return of humus residues to the soil, as happened in England centuries before.

Phosphate, a plant food that was never plentiful in the majority of New Zealand's soils in their original state, is a compound that enters into partnership with the iron and alumina of the clay in the soil, and thus the scant supply available to the plants is further reduced by actual fixation within the soil itself. Hence phosphate, if not originally a limiting factor, is usually the first plant nutrient that needs to be added if production is to be maintained. This explains the somewhat spectacular results obtained when superphosphate fertilizer is first added to the soil.

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29 H.B. MEN'S WEAR STORES—WHANGAREI TO INVERCARGILL.

With the increasing practice of phosphate top-dressing, the general productivity of the district goes up, but this in itself is no indication that soil decline has been arrested. True, the soils have begun to gain in phosphate, but unless attention is paid to other plant foods, the drain in lime, potash and magnesia will continue until they approach the stage when they limit plant growth. Sometimes the limiting element is a very minor one, like boron, manganese, molybdenum, or cobalt, the presence or absence of even the smallest trace of which has the most far-reaching effect on pastures and stock.

Complete (balanced) fertilizers are too costly for top-dressing large areas, but they are essential for orchards, horticulture, and vegetable growing. The part played by lime is well known to most farmers. Lime is not only of direct value as a plant food, but it helps to reduce soil acidity, and, with organic matter, builds up soil structure.

So far very little has been said about the decline and upbuild of organic matter. Any form of cropping enormously accelerates the loss of organic matter, and even the humus from green crops specially grown for ploughing in, is not sufficient to compensate for the organic matter destroyed in the production of the cereal crop of the year before. The maintenance of organic matter in cropping soils is a difficult problem in places where warm summer conditions promote rapid bacterial activity, and as a consequence humus is rapidly converted into soluble plant foods which are either used up by the growing crop or washed down into the subsoil during the following winter

With respect to green manuring, the stage of growth of the crop, and the time of season when it is ploughed in, both play a large part in determining the rate of bacterial decomposition. That excellent "indicator crop," linen flax, has shown up the very considerable advantage gained by ploughing grassland in early autumn, in order that the grass humus shall be at the right stage of decomposition for the growth of the crop in the spring. Linen flax, whose main requirements from the soil are firstly, adequate nitrogen, and secondly, adequate water, required a steady, even supply of both of these for the production of the highest grade fibre; and organic matter in the right stage of decomposition goes a very long way towards ensuring these conditions.

Permanent Agricultural Soil

The permanent agricultural soil is in a soil in balance with the agricultural environment. The phrase agricultural environment includes all the modifying influences that the farmer brings to the soil. Some types of agricultural environment, for instance, a well-managed dairy farm, favour a soil upbuild; while intensive cropping such as occurs on some rented land in the South Island causes soil decline at an almost unbelievable rate.

On most farms the agricultural environment comprises a mixture of influences, some encouraging soil decline such as cropping, and faulty stocking, others promoting soil upbuild seen in grass-farming with correct stocking, and it is the sum total of all these influences that determines the soil status.

With some types of farming it will never be possible to avoid interludes of soil impoverishment, but the farmer should keep a mental balance-sheet of soil fertility, and follow each period of unavoidable impoverishment with compensating treatment that encourages soil upbuild. Where the farming is unsuited to the soil, the whole fabric of agriculture in that district feels a dragging under-current of disquiet, and there is grumbling on high costs of production. Economic factors may be the main cause of unrest, but chiefly it is the peace of mind of the farmer that is disturbed when he senses a subtle change coming over his greatest asset. A contented farming community must needs have a soil in balance with a productive agricultural environment.

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- This is the reason why, in the high rainfall districts of 30 inches or more, Basic Slags—even those of low phosphate content—give good results.

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Production of Perennial Ryegrass and White Clover Seed

Effect on Soil Fertility

By A. H. FLAY,
Lecturer in Farm Management, Lincoln College.

DURING the past eight or ten years many farmers have sown white clover with either Italian or perennial ryegrass for seed production. Usually a crop of ryegrass seed has been taken in the first year, and then one or two crops of white clover seed. Some ryegrass seed may have been harvested with the white clover. Subsequently where perennial ryegrass has been sown, both ryegrass and white clover seed have been harvested together.

In the first year the management of the pasture is usually directed toward ryegrass seed production, while in the next season or two the area is managed to secure a white clover seed crop. Grazing and topdressing are the main factors of management, but the date of closing from stock may decide whether ryegrass or clover seed is taken.

Early closing from stock favours a ryegrass seed crop which usually contains some white clover seed, while heavy grazing in early spring and later closing favours a white clover crop. The most important factors determining white clover seed yields are the soil moisture content at closing time and the subsequent rainfall.

On mixed farms in Canterbury heavily and over-cropped paddocks are frequently fallowed—usually over the summer, and sown in summer or autumn to a mixture of certified perennial ryegrass and certified white clover for the combined purposes of ryegrass and white clover seed production, stock grazing, and restoration of soil fertility. That these aims are achieved is beyond question. Payable seed crops are secured, stock are grazed, and land ploughed out of such pasture always gives high-yielding crops.

Many progressive farmers in the arable farming districts of Canterbury have approximately one-third of their farms in cereals—wheat, oats, and barley; one-third devoted to peas; one-third in certified ryegrass and clover pastures.

Such pasture now-a-days would receive a **total** of perhaps 1 to 1½ ton of carbonate of lime, and 3 cwt. super per acre in two or more applications during the early years of its life. The pasture remains down normally for three to five years, or longer. In the past, such a pasture area was devoted almost entirely to sheep grazing. Seed production was a secondary consideration—"catch" seed crops being saved in favourable seasons. Since the introduction of certification, however, the greatest possible area of pasture is now reserved for seed, and in some instances this even amounts to the whole of the pasture area. Actually, ewes and lambs may be sold in October to achieve this objective. These progressive farmers obtain consistently high yields of wheat and barley, grow good crops of peas and Italian ryegrass seed, save large areas of perennial ryegrass from first year and older pastures, and wherever possible save white and red clover seeds. The fact that these farmers are able to do this consistently, clearly shows that soil fertility is restored while producing perennial ryegrass and clover seed crops.

Even though the pasture area should be saved for seed in successive years, the longer the area remains in pasture the greater the restoration of fertility. It has been observed that with a pasture that was down six years, and pro-

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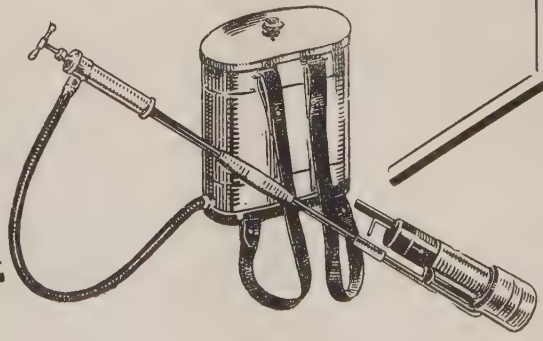

duced five successive perennial ryegrass seed crops, better yields of wheat were obtained after the area was ploughed up than before it was sown down. In this case no white clover was sown, but with regular liming and topdressing, some white clover, and much trefoil developed. There is much evidence on mixed farms throughout Canterbury confirming this aspect of restoration of soil fertility.

Fertility Restored

That soil fertility is improved while a pasture is annually producing ryegrass and clover seed crops is also shown by a steady increase in carrying capacity. This is well illustrated on a mid-Canterbury farm on which careful records of grazing have been kept.

The area concerned is a paddock of 20 acres. The soil is a medium loam over a shingle subsoil which contains areas of ironstone concretions running irregularly across it. The ironstone pan areas dry out readily. The sale value of the land in this paddock is put at £16 per acre. The area had produced four successive grain crops—three wheat, and one oats, yielding a total of 102 bushels of wheat, and 1¾ tons chaff per acre—immediately prior to being sown down with Certified Mother perennial ryegrass (1¼ bushels per acre), and Certified Mother White Clover (1½ lb. per acre). The manure sown with the seed was 2 cwt. per acre of a mixture of 1 cwt. superphosphate, and 1 cwt. carbonate of lime. The above seed mixture was broadcast with this manure. After the fourth grain crop was harvested in February, 1933, the area was autumn and winter fallowed, and the sowing carried out in mid-October, 1933. The cost of establishment was:—

	Total. £ s. d.		Per Acre. £ s. d.
Rent, rates and land tax	17 10 8		0 17 6
Man labour—33 days	13 17 7	Cultivation costs	0 13 10
Horse labour—1,057 hours	27 14 8		1 7 10
Manure—20 cwt. Superphosphate	4 16 11		0 5 5
20 cwt. Carbonate of Lime	0 12 0		
Seed 25 bushels Certified Mother Perennial Ryegrass	8 17 8		0 13 1
28 lb. Certified Mother White Clover	4 4 0		
	£77 13 6		£3 17 8

Topdressing Treatments

Topdressing was carried out as follows:—

Manure and Lime.	Quantity.	Date Applied.
Super	1 cwt.	September, 1934
Carbonate of Lime	5 cwt.	September, 1934
Carbonate of Lime	5 cwt.	June, 1935
Super	½ cwt.	October, 1935
Sulphate of Ammonia	1 cwt.	October, 1935
Super	1 cwt.	April, 1936
Super	1 cwt.	September, 1936
Super	2 cwt.	August, 1937
Super	1 cwt.	August, 1938

Total manure and lime *per acre* in five years = 6½ cwt. super.
1 cwt. sulphate of ammonia.
10 cwt. carbonate of lime.

The above manure and lime carted and applied cost anually 12/- per acre.

Rainfall Records

The rainfall records at Ashburton, some eight miles distant, for the period is given in the following tables.

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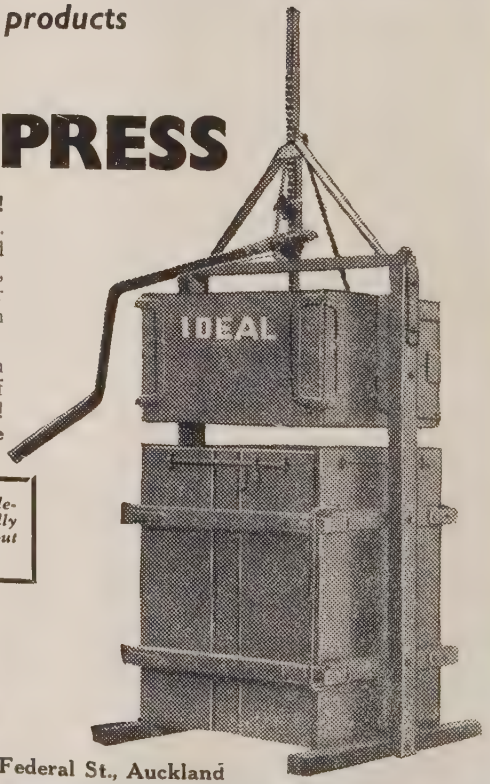

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TABLE I.
Rainfall for period May, 1933, to April, 1939 (inclusive).

Year.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Total.
1933-34	1.97	1.04	2.83	1.34	0.99	2.69	4.39	3.32	7.15	2.37	2.28	1.47	31.84
1934-35	4.76	2.64	1.32	3.28	3.03	2.19	1.43	0.58	1.64	2.46	3.08	2.37	28.78
1935-36	2.56	4.84	2.03	0.96	2.05	2.64	4.68	1.23	1.05	9.44	7.73	2.16	41.37
1936-37	0.74	1.34	4.49	1.42	1.58	1.06	6.61	2.76	2.71	4.65	2.08	1.86	31.30
1937-38	2.49	1.83	2.04	0.74	2.08	0.64	1.51	6.18	4.31	1.53	2.02	6.72	32.09
1938-39	0.30	6.53	8.62	1.44	2.85	2.49	3.52	4.82	0.31	0.72	1.90	1.03	34.53

The main features of this table are the irregular total annual rainfall, and the relatively high total summer precipitation in the season 1935-36, 1936-37, and 1937-38 with a monthly distribution not well suited to white clover seed production on medium soils. Either the weather was too dry in December and January (1935-36), or too wet at harvest time as in February and March, 1936, January and February, 1937, and January, 1938.

Grazing Records and Seed Yields

Grazing with fattening lambs was commenced in January, 1933, about 2½ months after sowing, and was continued throughout the autumn. Subsequent grazing was mainly with dry and in-lamb ewes, except for a time in the spring ewes and lambs were grazed on the area. The details of grazing and seed yields are as follow:—no grazing was taken at that time. Even then the yield of machine-dressed certified ryegrass seed was only 17 bus. per acre. These facts indicate that the soil fertility was low.

On this medium soil seed production was not particularly successful. Contributing factors to low yields were drought conditions in December and January of the 1935-36 summer, followed by excessive rainfalls in February, 1936 (9.44 inches), somewhat similar conditions and strong winds in 1936-37, grass-grub attack partially ruining the pasture, especially the white clover in the sward in the 1936 and 1937 autumn and spring. Each season the main crop was headed and threshed out of the swath, and on one occasion threshed out of the stack by contractors who did not always arrive at the most suitable time. The straw was left on the paddock. The fact is, however, that despite seed crops being taken annually the pasture increased in carrying capacity. Even though grass grub partially ruined temporarily the greater portion of the area in the autumn, winter and spring of 1936, and to a lesser extent in 1937—and this damage was reflected in the average grazing for 1936-37 season—yet in 1938-39 it was in a much more vigorout state than in 1934-35. In 1938-39 hairgrass was beginning to invade the sward, and it might be mentioned that it was not intended to take a seed crop that season, but with the favourable growth conditions the paddock was shut up late. A machine-dressed yield of 55 lb. per acre of Certified White Clover and 3 bushels per acre of certified ryegrass were taken. Such a steady improvement in the volume of grazing, and condition of the sward, can only be associated with a rising fertility status brought about by the production of improved strains of pasture plants, especially white clover, consistently topdressed with lime and super.

Financial Results

The cost of establishing this pasture was almost £4 per acre. The soil has been raised in fertility, and a good pasture remains. The question now raised is the economic one of what is the cost of such soil improvement?

TABLE II.
Grazing Per Acre by Months—Dry and In-Lamb Ewes.

Year.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Total	Av. 12 mths		Yield Seed per Acre (M.D.)
1933-34	Paddock fallowed and sown Oct. 15 to 17, 1933								7.12	12.01	3.68	3.85	26.66		Early flush after sowing not averaged.	
1934-35	3.66	1.06	Shut July 1 and left ryegrass seed. Grazed again Jan. 28.						1.26	6.90	1.70	0.35	14.94	1.24	First harvest year—Saved ryegrass seed.	17 bus.
1935-36	1.03	0.92	0.27	5.62	8.26	Shut Oct. 1 White clover and ryegrass seed. Grazed again April 1.						3.38	19.48	1.62	Second harvest year—Saved White clover and some ryegrass.	30 lb. Wh. Cl. 12 bus. R'grass
1936-37	1.16	1.06	0.87		0 02	2.25	Shut Oct. 12 for White clover seed. Grazed again Mar. 20				1.61	3.03	10.00	0.83	Third harvest year—Saved White clover.	14 lb.
1937-38	6.78	0.70	0.80	2.06	1.77	4.65	Shut Oct. 23, Ryegrass seed saved. Grazed again Nov. 10.				5.32	11.00	33.08	2,75	Fourth harvest year—Saved ryegrass.	7½ bus
1938-39	4.29	1.52	0.48	1.35	1.26	5.55	5.33	Shut Nov. 18 White clover and ryegrass seed saved. Grazed again Feb. 18.	3.14	11.70	3.33		37.95	3.16	Fifth harvest year—Saved White clover and ryegrass.	53 lb. Wh. Cl. 3 bus. R'grass
Av.	3.38	1.05	0.48	1.81	2.26	2.49	1.07	—	0.25	2.01	4.07	4.22	23.09	1.92		20 lb. Wh. Cl. 8 bus. R'grass

This table shows a steady increase in annual grazing over the five years from 1¼ dry ewes to just over 3 dry ewes per acre (the first flush in pasture production immediately after sowing is not included). Because of the lengthy fallow before sowing down and the abnormally high summer rainfall (see Table I) of nearly 21 inches from 1st November, 1933, to 30th April, 1934, the new pasture gave a good summer and autumn flush of feed in the first winter and early spring that

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The annual financial position and the financial situation for the area for six years (1 year of establishment and 5 years of grazing and seed crops) is presented in the following table:—

TABLE III.

Financial statement for a Twenty-acre Certified Mother Seed perennial ryegrass and Certified Mother Seed white clover pasture for six years from establishment to 30th April, 1939.

Year.*	Costs.†	Returns.				+ Profit. — Losses.
		Grazing.	Per. rye seed.	White clover seed.	Total Returns.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1933-34	95 4 6	22 11 2	—	—	22 11 2	—72 13 4
1934-35	90 0 2	15 6 0	105 18 9	5 6 3	126 11 0	+36 10 10
1935-36	111 4 8	16 10 5	66 1 5	69 5 6	151 17 4	+40 12 8
1936-37	48 19 1	16 8 5	—	15 0 0	31 8 3	—17 10 8
1937-38	87 14 4	36 4 2	38 0 0	—	74 4 2	—13 10 2
1938-39	63 19 11	41 12 4	10 10 0	70 10 0	122 12 4	+58 12 5
Total	497 2 8	148 12 6	220 10 2	160 1 9	529 4 5	+32 1 9
Yearly six-year average ..	82 17 1	24 15 5	36 15 0	26 13 7	88 4 1	+5 6 11
Yearly average per ac. 6 yrs.	4 2 10	1 4 9	1 16 9	1 6 8	4 8 2	+0 5 4

* The financial year covered a period from 1st May to 30th April.

† This sum represents the cost of establishment plus rent, etc., for the year. Although this particular paddock is considered to have a sale value of £16 per acre, the rent (interest), rates, and land tax on this farm, and included in the costs presented above, averaged over the six years 1933-39 £1/7/3 per acre per annum.

The actual rent (interest), included in the annual costs presented in this table exceeded the writer's estimate of the rental value of 16/- (5% on £16) per acre by 9/-. The actual cost of establishment of this pasture was approximately £4 per acre. The grazing returns were obtained by allocating to the various paddocks the profit from sheep in accordance with the carrying capacity (i.e. sheep-days). In 1933-34 the figure was 2.3 pence, and in 1938-39 it was 3.0 pence per sheep-week.

The average figure was 2.85 pence per sheep-week. Sales of certified permanent pasture ryegrass seed (machine dressed) averaged 4/11 per bushel, and certified permanent pasture white clover 1/8 per lb. (machine dressed).

An annual profit of 5/4 per acre is not good. It must be remembered, however, that at the commencement the soil in this paddock had been heavily cropped, and that during the period of six years in pasture fertility was significantly raised. The area was not well suited to ryegrass and white clover seed production because of its liability to dry out rapidly, with the result, that over the five harvest years the yields of machine dressed seeds were only a yearly average of 20 lbs. white clover, and 8 bushels perennial ryegrass per acre. Also the early portion of this period covered the latter part of the 1931-35 slump with the result that the prices for seeds were low (see above). To-day (1943) with prices more than double those of 1933-39 the opportunity for profit even with low yields is good. With reasonable or high yields to-day substantial profits are being made from seed production from certified ryegrass and certified white clover

Further. an annual profit of 5/4 per acre, if it were obtained from the whole farm, would represent a profit of over £100 per annum. Had mixed farming in Canterbury, after paying full interest, been able to earn this profit for the period 1933-39 there would have been little need for the passing of legislation to reduce mortgages, and write off arrears of interest. The fact is, that to earn a profit of 5/4 per acre during the period 1933-39 while at the same time restoring fertility on an over-capitalised soil, even though it is not a good performance, is no mean achievement. In 1939 the pasture was still in a highly productive condition, and when an inspection was made in 1941 it was still in an attractive state.

On other farms with similar soils, very much the same results have been obtained, though heavier yields of ryegrass seed have been more usual in the first year. Also exceptional "catch" crops of 300 lb. and 400 lb. per acre of white clover seed have been harvested. On these farms, however, complete and detailed records of grazing, costs, and returns over a number of years have not been kept.

Summary

(1) Soil fertility can be built up during a period under pasture even when seed crops are taken practically every year.

(2) Such seed crops are profitable, particularly when the seed produced is certifiable even though the yield is low.

(3) This can be accomplished even on land that is normally considered unreliable for seed production because of its liability to dry out rapidly.

(4) In addition stock carrying capacity is progressively raised.

Conclusion

There can be only one conclusion from the evidence presented, viz., that even when ryegrass and clover seed crops are taken annually from a pasture, restoration of soil fertility can be accomplished. The use of certified seeds, especially clovers, properly established, and regularly topdressed are important contributing factors. Restoration of soil fertility may require a little capital outlay in pasture establishment, but when associated with certified seed production it can be a profitable feature of progressive mixed farming.

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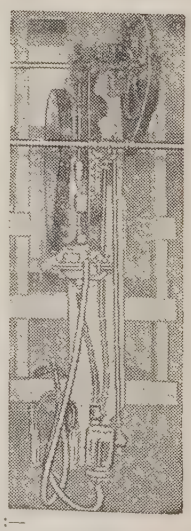

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THE CONTROL OF SUBTERRANEAN GRASS CATERPILLAR IN PASTURES

— By —

L. J. DUMBLETON, Division of Entomology,
Plant Research Bureau, Cawthron Institute, Nelson.

THE subterranean grass caterpillar is the accepted common name for the caterpillar of a moth which has previously been known as *Porina* and is now known as *Oxycanus*. An illustrated account comparing this insect with the grass grub was published in the "Journal of Agriculture," March, 1941, and copies of this issue may be obtained from the Department of Agriculture, or reprints of the article from the Division of Entomology, Cawthron Institute, Nelson.

It is of vital importance that farmers should be able to distinguish between this insect and the true "Grass Grub" (*Odontria*), because, while both cause severe damage to pasture, the treatment which is effective in controlling one is of no avail against the other.

Life History

The moth flies at dusk, in large numbers, about the middle of October, but it may be later in more southerly districts or at higher altitudes. The eggs are laid on the pasture and soil surface, and hatch in about a month. The caterpillars are therefore present —at first very small—from the end of November on to about the end of August, after which they change into the chrysalis stage, which lasts about six weeks and from which the moth emerges. The caterpillars live in tunnels in the soil, though they emerge at night to feed on the grass leaves.

Infestation of Pastures

The greatest damage is done to the better pastures of ryegrass and white clover, but subterranean and Montgomeryshire Red Clover are also severely damaged, as are mixed pastures—even those containing much cocksfoot.

Damage to a spring-sown pasture in the first year of its life does not commonly occur, but in its second year this pasture may show a light patchy infestation, and in its third year it may be completely destroyed.

It appears that the shutting up of a paddock in spring for a subsequent hay or seed crop favours the development of an infestation. In a district which has normally a low rainfall in November, a heavy rainfall may make conditions suitable for the caterpillar even on pastures subject to grazing. In such districts the infestation is usually worse on land with a southerly aspect—the so-called dark or back faces.

Diagnosis

The extent of the damage which will be done depends on the number of caterpillars present, and the longer the caterpillars are allowed to work the worse will be the damage. By waiting till March or April it is easy to pick out the infested parts of a paddock merely by the absence or thinness of the pasture on these parts, but by then the damage may be irremediable.

It is possible to find the caterpillars in infested pastures in January before ever the pasture shows signs of damage. They are then about ½in.-¾in. long. They may be found by digging up a square foot of soil down to 6 in. depth and crumbling it up by hand, and collecting and counting the caterpillars. To get a reliable estimate of the heaviness of the infestation, and its distribution in the paddock, samples should be dug throughout the paddock. Twenty or more samples should be examined. If the average number of caterpillars is 10 or more per square foot, severe damage may be expected to develop later in the autumn.

Treatment

It has been found by experimental work in the past three seasons that about 80 per cent. of the caterpillars can be killed by one application of a poisoned bran bait, and that this treat-

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ment is effective in preventing severe damage to pastures in that season.

The bait which has been used consists of:—

2 lb. Paris Green or 4lb. of lead arsenate
50 lb. of bran
6 gallons of water
} per acre.

This quantity is sufficient to treat one acre. Satisfactory results may be possible by using only 1½ lb. of Paris green or only 25 lb. of bran.

The poison and the bran while still dry are thoroughly mixed with shovels on a mixing floor. The water is then added, and the bait is mixed again with shovels, and then tossed through a broad-pronged fork. It should be moist but not sloppy, and should break readily into the individual particles. At a later stage it should be possible to recommend suitable types of mechanical mixers.

The bait can be spread by hand on small areas or it may be possible to adapt some of the existing types of manure distributors. Very satisfactory results have been secured with a specially designed machine which is capable of spreading bait on 10-20 acres in an hour. One of these machines was constructed for experimental work and it cost about £80. The plans and specifications will be made available to any person who wishes to have one constructed. It is suggested that communal ownership of one of these machines in a district which suffers regularly from this pest would be most economical, since any one farmer would not want to use it for more than one or two days in the year.

The cost for the above treatment is about 8s. or 9s. per acre. The sale of bran is at present under license, but the Wheat and Flour Controller has been advised that there is likely to be a demand for bran for the purpose of controlling the caterpillar and will give consideration to any requests for bran for this purpose. Paris Green is not normally in good supply, and difficulty may be experienced in obtaining it in bulk at the present time. It costs about 2/6 per lb. Lead arsenate is equally effective when used at double the strength and is likely to be much more readily obtainable from firms which supply it for orchard spraying. It was quoted this season at 1s. per lb., so that even at double the strength it is actually cheaper than the Paris Green.

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Lincoln Trials

In connection with the spreading of poisoned bait the results of some work carried out at Lincoln Agricultural College are of particular interest. The report on this work as received by the Department is as follows:—

"Several paddocks on the Canterbury Agricultural College farm at Lincoln were found to be heavily infested with *Porina* in the winter of 1942. Early in July 116 acres were dressed with lead arsenate and bran in the proportions of 2 pounds to 30 pounds. Unfortunately heavy rain fell shortly after the application of the bait, so it was decided to apply a second treatment to 50 acres of the more heavily infested portions. The second application was carried out, using Paris Green in place of lead arsenate at the rate of 1 lb. Paris Green to 30 lb. bran per acre. Molasses was used very sparingly because it was realised that a sticky mixture would tend to clog the machine. No difficulty at all was experienced in applying the mixture provided an excessive quantity of water was not added to make it too wet. The machine could readily be adjusted to distribute evenly 31 pounds (dry material) or less per acre. Two types of machine were used.

1. An eight-foot horse topdresser (i.e. fertiliser distributor) with a maximum daily acreage of 12 acres.
2. A fourteen-foot motor truck topdresser attachment, with a maximum daily acreage of 80 acres on this class of work with all materials ready mixed.

The readiness with which this type of insect control is accepted by the farmer will depend largely on whether or not he can apply the material with the normal equipment already on the farm. The experience gained from the trials on the college farm in July, 1942, warrants the statement that a farmer should have no difficulty in spreading poison bait with an ordinary topdresser.

The results obtained from the above trials were very satisfactory in spite of the fact that the application was several weeks late, and the total cost—materials, mixing applying—was approximately 7/- per acre."

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Rearing the Litter

Contributed by the Livestock Division.

ATTENTION given to a litter from birth to weaning probably returns more satisfaction to the owner than is returned for care spent on pigs at any other time of their lives. The litter is the pig harvest, and as with crops, harvest is the time when hopes and fears are realised. When the harvest is abundant, satisfaction results not only from the material reward but also from the knowledge that effort spent was not in vain. Just as the abundance of the harvest is paramount in the profits of a farm, so the excellence of the litter is the foundation of profitable pigs.

All animals at birth have a decided inclination to grow rapidly, the so-called "growth force," and if this is destroyed by their being kept under conditions unsuitable for growth, the animal loses its ability to resist infection or to eliminate from its system poisonous by-products associated with digestion. These infections, which manifest in the weakly, and are usually blamed for their poor health and growth, are secondary in nature. They are present everywhere, but do not appear in the thrifty pig simply because he has higher powers of resistance. The thrifty weaner is thus the foundation of the profitable baconer.

Feeding

It is generally agreed that for the first three weeks the piglets get all their nourishment from their mother's milk, and for this reason the three weeks' weight has been used as a measure of sow quality, milking capacity, etc. At three to four weeks the sow appears to have reached her maximum milking capacity, but the feed requirements of the litter continue to increase daily, and feed other than their mother's milk is necessary if the piglets are to grow as fast as nature intended. It is just the same with pigs as with lambs, except that the latter can collect from grass whatever feed they require to supplement their mother's milk, whereas the owner has to supply it for the piglet.

It must be realised that the piglets have to learn to eat, and therefore that it is necessary to provide appetising food, offered in small amounts when they are hungry, until they eat it readily. Sows are often turned out during the day, and if a little skim-milk and meat-meal is placed before the piglets when they are being taught to eat, just before the sow comes in, they are more likely to be interested than if it is put down while the sow is present and ready to supply them. Once they have begun to eat it does not matter so much when they are fed.

Creep Feeding

The Waikato and Manawatu Pig Recording Clubs have achieved splendid results by using a creep through which the piglets get access to their feed supply, and which keeps the sow from it. The creep is easily made by spacing boards with six-inch openings between them across the top and bottom four by twos that are nailed across the corner of the sty. The trough is put behind this in the corner, and the little

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Sows that are quiet produce pigs that are easy to handle.

pigs get through the openings. There are many and varied kinds of creeps described in the Department's free Bulletin 177, "Layout and Construction of Modern Piggeries."

It has been found that pigs fed on the creep system average about ten pounds better at eight weeks than where no creep is provided, but where the piglets, nevertheless, have access to the trough along with the sow. Further, it has been found that the final weights at eight weeks are in keeping with the amount of feed used in the creep. While 10 lb. of feed per piglet gives 40 lb. weaners, 15 lb. per piglet gives 45lb. weaners. Creep feeding is fundamentally sound, because it ensures no check on the pigs at weaning, and so makes it possible to keep them going till they are twelve to fourteen weeks old. After this age, pigs that are well grown can be put on to any class of feed without serious reaction to their health, and often with splendid results from the economic point of view. Too many make the mistake of using unsuitable feeds in large quantities as soon as the pigs are weaned.

The Sow

When suckling a litter the sow requires feed and plenty of it. Careful observation, however, is worth more than any hard and fast feeding regulation. Big sows will require more than small sows; this also applies to litters, and it is only when sows are well fed that it is possible to produce fast growing pigs, upon which economic production largely depends.

When well fed, the milking qualities of the sow can be ascertained by the weight of the litter at three weeks, which should be at least five times their birth weight. Well weaned is half grown. It is difficult to obtain well grown weaners unless they have had the advantages of a good feed supply in the first three weeks of their lives, which can only come through the milking qualities of the sow at that critical stage.

Amount of Feed

It is usually reckoned that an average sized sow wants six pounds of feed, or gallons of milk per day for maintenance, and a pound of feed, or a gallon of milk per piglet, while suckling the litter. While this is a useful guide it is unwise to lay down any hard and fast amounts. Successful feeding depends on the intelligent observation and experience of the owner, and it is his obligation to feed his

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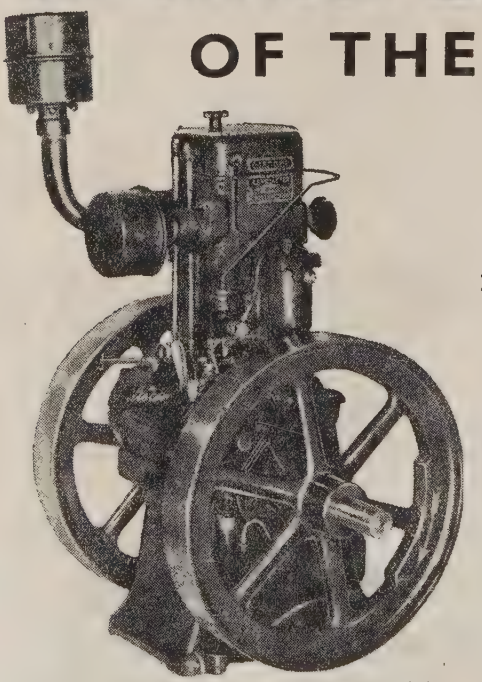

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animals as much as they will eat in, say, 20 minutes, and keep them looking for their meal when feeding time comes round.

For the first three weeks the sow will probably take the whole 12 gallons. At five weeks she may be getting 10 gallons, and the litter 6 gallons, and at eight weeks she may be getting 8 gallons, and the litter of eight another 10 to 12 gallons. If the sow is getting thin she wants more feed, if fat, less. Where sows are turned out to grass they often get all their maintenance as pasture, and this, along with two or three gallons, may suffice as weaning-time approaches.

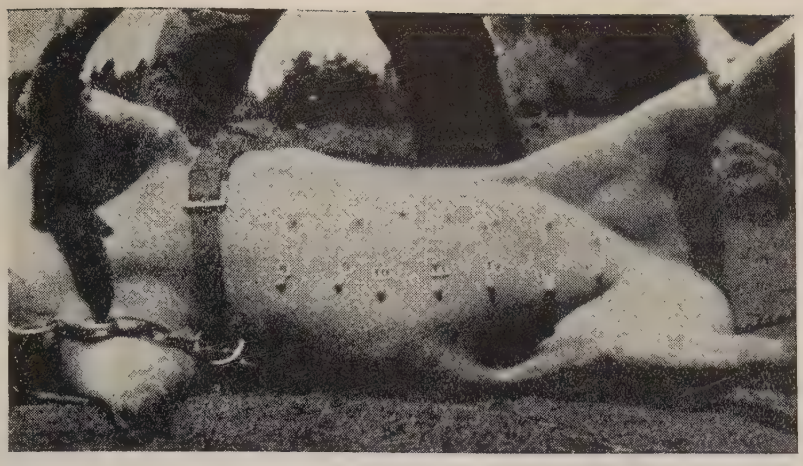
Setback to Litter

Up to three weeks most litters experience very little trouble unless it be from scours. This probably arises from some infection picked up in the sty, and it is most difficult to combat. Treatment of the sow is probably the most satisfactory way. A dose of salts to check the milk flow for 24 hours and thereby give the litter a mild starve is probably quite useful. Many owners have great faith in different kinds of mineral licks, especially those containing iron, since anaemia of the little pig is often blamed for babyhood upsets.

One of the most noticeable happenings when a litter is let out from the sty for the first time is the avidity with which they consume ordinary soil. Each pig must eat ounces of it in the first few hours. Investigators the world over have offered explanations of this soil-eating proclivity, and in view of these investigations, and of the already wide adoption of the practice of putting a fresh sod of earth into the little pigs that are in sties, the Department of Agriculture recommends it strongly. Soil possesses valuable absorbing properties for some of the by-products of digestion. It contains suitably low concentrations of essential elements such as lime, phosphorus, potash, soda, magnesium, iron, chlorine, sulphur, and most soil contains those mysterious trace elements which appear to be just as essential to health as many of the better-known minerals. Fresh soil that is free from internal parasites may satisfy the pig's desire for exploring the floor of his sty, and so reduce the possibility of picking up infection that gets into the sty by various channels. Give the little pigs clean soil in preference to dirt brought in on the sow's udder.

Generally speaking, pigs bred under open-air conditions are healthier and show more resistance to disease than those bred indoors.

You are entitled to the assistance and advice of your District Pig Council Supervisor. Pig producers have provided the funds to enable these councils to be set up, and all farmers are urged to take every advantage of these facilities. Applications for assistance should be made to the Department of Agriculture or to District Supervisors as follows:—Whangarei (Box 131); Pukekohe (Box 32); Whakatane (Box 12); Gisborne (Box 316); New Plymouth (Box 131); Palmerston North (Box 80); Dunedin (Box 693); Christchurch (Box 639); Hamilton, care Department of Agriculture.



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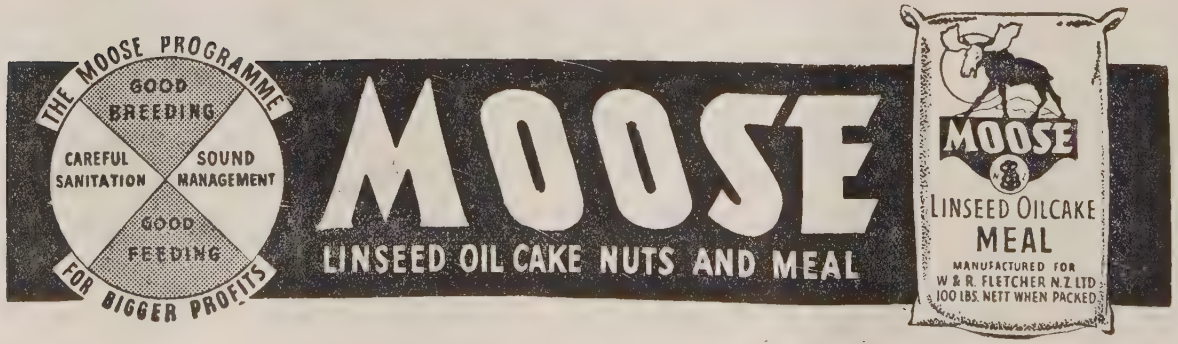


Winton Grazing Trials . . . .

Feeding Value of Perennial Ryegrass Strains

By J. W. WOODCOCK, Fields Superintendent, Dunedin, and A. STUART, Instructor in Agriculture, Invercargill.

WHEN certified perennial ryegrass was first introduced to Otago and Southland, farmers did not receive it with enthusiasm. This was probably because too much was made of its regional aspect—it was called Hawkes Bay or Poverty Bay ryegrass more often than it was called certified ryegrass, and farmers generally, with a good deal of justification, have to be convinced that a variety or a strain from some other place is suitable for their own conditions. Since the climatic conditions of Hawkes Bay or Poverty Bay were so different from their own, Southland farmers therefore were difficult to convince that this strain of ryegrass, considered by North Island standards to be more productive and more perennial than their own strain, was suitable for pastures in Southland.

Trials

Trials and demonstrations were laid down by officers of the Fields Division, and these proved conclusively that the claims made on behalf of certified ryegrass were substantially correct. But the trials also proved that while the latter was a more or less standardised article, Southland ryegrass was not. There were some lines which were very poor and did not deserve the term "perennial"; there were other lines which lasted 4 or 5 years; but there were also some which lasted for much longer, and even although they did eventually "go out," they outlasted the span of life for a Southland pasture, which, on a rotational farm, is ploughed up every few years to make room for turnips or oats. Even in official quarters this aspect is being recognised and has resulted in a "new model" being produced for such conditions, namely, "short rotational ryegrass."

The present position is that in Southland the use of certified ryegrass is still not universal as it is in most other districts. Until it has been tried and tested to their satisfaction, many farmers are not inclined to dispense with the lines of ryegrass originating from their own district. They argue thus: "Performance under our farming conditions over a period of six or seven years counts for more than a 'perennial' reputation. We have in the South seed from old pastures which, while not possessing pedigree, breeding, or the capacity to satisfy a laboratory test, will fatten more lambs **under Southland conditions** than the strains of certified ryegrass from the North Island."

It is difficult to prove or disprove such a statement for it entails an elaborate experiment extending over a period of years, using livestock as the yard-stick rather than mere observation or the use of a lawn mower, or tiller counts, or the measurement of grazing days, or any of the other short-cuts of the grassland scientist.

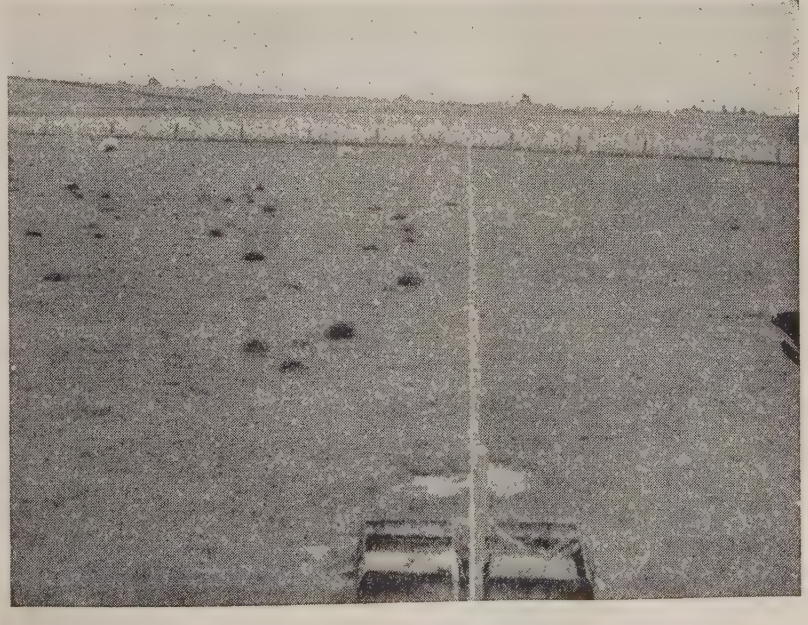
It was fortunate, therefore, that in the very district where this ryegrass controversy was the strongest there was available the Winton Experimental Farm on which an experiment could be conducted, and where sheep and lambs could be available for trial. It was therefore decided to test out on this farm the best strains of Southland ryegrass against the Hawkes Bay type to determine whether or not the former was a better proposition for the purpose of fat lamb production.

The Winton Experimental Farm Committee set itself to carry out the trial in a very thorough manner, more land was leased on an adjoining area to supplement land already available, while the farm, hitherto devoted to dairying, was changed over to sheep.

Details of Layout

Details of the sowing of the experiment were published in the "Journal of Agriculture," January, 1938, and the first year's results in the issue of September, 1938. To reiterate briefly, four comparable paddocks, each 2½ acres, were sown in October, 1936, with a blend of ten lines of Hawkes Bay ryegrass (all purchased locally), while four other paddocks were sown with a blend of the ten best Southland ryegrasses available.

It should be noted that this trial is not strictly one comparing certified with uncertified seed, but rather one comparing best Southland types irrespective of certification with standard certified Hawkes Bay types on sale in Southland. The Southland seed was



Left.—Southland ryegrass. *Right.*—Hawkes Bay ryegrass. Note the presence of Scotch thistle in the Southland ryegrass.

obtained from areas at least 10 years old, and some of the lines used in the blend were up to the standard of certification in the class now known as "Permanent Pasture." The seed mixture sown was at the rate of 30 lb. of ryegrass plus 3 lb. of ordinary commercial Southland white clover. (In order to avoid repetition throughout the remainder of this report, the fields containing Hawkes Bay ryegrass will be referred to as "Northland" fields, while those sown with Southland ryegrass will be known as "Southland" fields.)

All the fields were well limed and manured when sown down, and they received annual applications of phosphatic fertiliser. A line of 120 two-tooth Romney ewes was divided up into two separate flocks, 60 being confined to the "Northland" fields, and 60 to the "Southland" fields. The results from only three of the four fields of each treatment are taken into account, however, because the fourth field was reserved as a holding paddock. In low production periods it was intended that any ewes taken out temporarily from the three main fields would be held on the type of herbage they were accustomed to. Both flocks grazed their own specific type of ryegrass from February, 1937, until the close of the experiment in March, 1941.

This report therefore not only describes the progress of fields sown with different ryegrass strains, but it also gives a history of two sheep flocks, from youth to old age, grazed on the two types of ryegrass. It records the weights of wool produced and its value, the number of lambs, lambing percentages, the weight of fat lamb and its value during each of the four years.

Conduct of Trial

Salient features of the conduct of the trial were:—

1. Both treatments were grazed in conformity with accepted principles of good management. At no stage was any pasture allowed to get out of hand or grazed too hard. Extra sheep were brought in to keep down any surplus growth, or some ewes were moved to the fourth paddock when growth on the three main paddocks appeared to be getting short. Thus, great care was taken to ensure that surplus growth or lack of feed were avoided. Either of these two circumstances would have had a direct bearing on the thriftiness of the lambs.

2. Both ewe flocks were kept up to 60 in number; in the event of deaths other sheep of the same age were substituted, except in the last year. Fortunately this was rarely necessary. Southdown rams were used and were changed from one flock to another at tupping so as to eliminate the influence of sire on the lambing returns.

3. During winter it was not possible to keep the flocks in their respective pasture all the time, and they had to be put on to swedes for five or six weeks. During this period they had a run-off on to a common pasture, but hay composed entirely of Timothy and clovers but **no ryegrass** was fed out to them.

4. The ewes grazed normally and did not have to be forced on to the feed available. At no time was there any suggestion of unpalatability. Occasionally the mower was used to keep down thistles and similar weeds.

5. At shearing, wool from each flock was kept separate and this was valued through the courtesy of the Southland Farmers' Co-op. Association, Invercargill. Weights of wool did not include belly wool except in the first year.

6. The lambs from each flock were branded at birth with separate distinguishing marks so that no confusion could arise in their identity. Lambs were drafted when considered necessary and a report on the weight,

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condition, and price obtained from the carcasses was furnished by the Ocean Beach Freezing Co., Ltd. Lambs remaining at weaning time were valued at the current ruling rates for rape lambs.

Composition of Pastures

All the paddocks established well. A common flock was grazed on them during January, 1937, chiefly to eat down the spurrey which came up with the grass. The fields were grazed again by the common flock during February, March, and April, after which the sheep were divided up into their respective units. In the initial establishment the Northland fields appeared to have the better sward, especially as regards ryegrass. The establishment of white clover was poor in the early stages.

Point analyses were made by Mr. S. H. Saxby, Instructor in Agriculture, Dunedin, during the progress of the trial. These were carried out twice a year, namely, spring and autumn, to determine the proportion in which the various species were present. To enable comparisons to be made from year to year these point analyses have been expressed as percentages in the accompanying table.

It will be seen that after October, 1938 (two years after the trial was sown), the ryegrass content of the Southland fields began to decline until an equilibrium was reached at about 30 per cent. during the last two years. No marked difference in clover content is apparent although this species was slightly more prevalent on the Southland fields. The most marked differences in composition were those in connection with brown top and also in regard to inferior grasses and weeds.

(To be continued)

Some of the ewes at the commencement of the trial. The two flocks have since been continuously on Hawkes Bay ryegrass and Southland ryegrass respectively.

TABLE I.—Point Analyses of Trial Fields (Per cent.)

Date.	Fields.	Bare Ground %	Perennial Ryegrass %	White Clover %	Browntop %	Inferior Grasses or Weeds. %
May, 1937 ..	Northland	39.6	51.5	4.8	—	4.1
	Southland	45.7	46.3	3.8	—	4.2
October, 1937 ..	Northland	24.0	**62.9**	8.7	trace	4.4
	Southland	24.0	61.3	8.5	trace	6.2
June, 1938 ..	Northland	31.9	57.3	7.3	1.3	2.2
	Southland	35.1	50.6	9.1	1.2	4.0
October, 1938 ..	Northland	**26.0**	59.8	6.4	1.1	6.7
	Southland	22.3	**50.8**	9.2	4.7	13.0
May, 1939 ..	Northland	20.4	60.0	13.0	1.6	5.0
	Southland	21.2	44.1	16.3	6.1	12.3
November, 1939	Northland	12.1	45.6	25.8	1.9	14.6
	Southland	10.0	31.7	26.6	11.5	20.2
April, 1940 ..	Northland	9.2	60.8	22.5	3.8	3.7
	Southland	10.6	35.5	24.1	17.9	11.9
October, 1940 ..	Northland	7.3	50.8	25.0	5.9	11.0
	Southland	7.7	31.4	24.9	15.6	20.4
May, 1941 ..	Northland	19.5	59.2	12.1	1.5	7.7
	Southland	16.3	38.5	**19.0**	12.2	14.0

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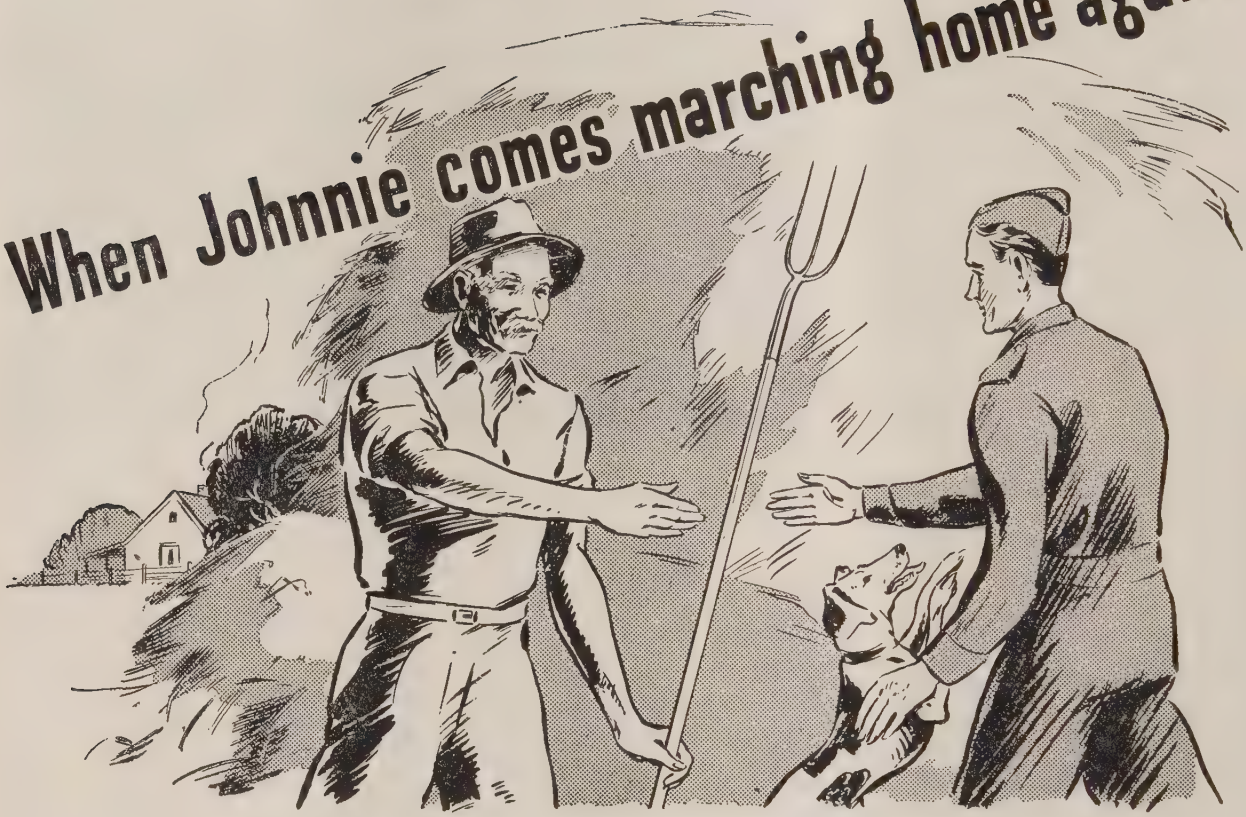

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C. R. TAYLOR, Fields Instructor, Rotorua, Discusses

The Establishment of Pampas Grass Plantations in Auckland and Bay of Plenty Districts

ALTHOUGH a good deal of publicity has been given the growing of pampas grass in recent years, there still appears to be a considerable number of farmers who are interested in the practice, but know little or nothing about it. It would appear, therefore, that further information on the culture of pampas grass is justified, particularly as the autumn period is a good time in which to establish a plantation.

Soils

Pampas grass is not particularly exacting in its demands so far as soil and climate are concerned. Many farmers imagine that nothing short of a soil possessing the highest fertility — a drained swamp, for instance—is of any use for successful pampas-grass culture. This is by no means the case, as has been demonstrated many times in actual practice. The plant will do best under really good soil conditions, but perfectly satisfactory results are possible in less favourable circumstances, provided reasonable attention is given to the selection of a plantation site, and consideration is shown to the young seedlings or rooted cuttings during their first year of establishment.

Soils which do not retain an average amount of moisture over the summer period or become thoroughly waterlogged in the winter are useless for good pampas grass growth. Moderate to warm conditions, together with a well-distributed rainfall, as occurs in most parts of the Auckland Province, suit pampas grass best, but it is surprising what rigorous climatic conditions it will tolerate when firmly established.

Feeding Value

The feeding value (from analysis) of pampas grass has been stated by a prominent agricultural authority in this country to be comparable with other green fodders, such as green maize and oats, provided that the components are equally digestible. While the importance of digestibility when comparing the relative feed values of various fodders as indicated by chemical analysis—the only real test being actual feeding trials made under controlled conditions — cannot be overlooked, it would appear that, after many years of practical experiment by farmers over a wide area, any doubts that may have existed regarding the feeding value of pampas grass have by now been completely dispelled.

The yield is influenced by such factors as climate, soil fertility, and general care given the plantation. Under average conditions one acre of firmly-established pampas grass, plus a reasonable run-off or its equivalent, will provide one month of grazing for 50 to 60 head of grown cattle. Where better conditions apply the carrying capacity is correspondingly higher, but it would be a mistake, and quite unfair, both to the farmer and to pampas grass, to make too extravagant claims. On occasions in the past such extreme claims have been made for pampas grass, that a disservice has been done to this young, growing-up farm practice.

Farmers are urged, therefore, to take a moderate view of its potentialities, and not one with a tendency leading to either extreme. If this suggestion is adopted, little or no disappointment will result from any attempt to establish and maintain this worthwhile perennial crop.

Seedlings

The first step in the establishment of a good pampas plantation is the purchase of either strong, healthy seedlings, or well-rooted plants. Seedlings are preferable as they are substantially cheaper than the plants, and just as satisfactory in every other way.

The seedlings should be planted out in nursery rows in some sheltered spot for further development. The nursery rows (Fig. 1) require to be spaced about 18 inches apart, while the seedlings can stand 6 inches apart in the rows. Frequent cultivation where necessary to control weed growth should not be neglected, as development into strong plants largely depends upon the care and attention given to this operation. Approximately 4 to 5 months of this treatment is necessary before the seedlings are sufficiently grown to enable their transfer to a permanent site. Fig. 2 indicates the growth that may reasonably be expected following nursery row treatment as suggested.

Plantation Site

The selection of a site for the permanent plantation is all important, and this can be given careful consideration while the seedlings are maturing. Bearing in mind the necessity for the efficient utilisation of the herbage produced, several factors must be given recognition. Among these are:—

(a) The practicability of adequate preparation of the area in both initial and subsequent inter-row cultivation.

(b) The location of site in relationship to suitable run-off paddocks.

(c) The proximity to adequate water supply for stock, or, alternatively the ease with which water can be made available.

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(d) The shape of area in view of the need for breaking off the pampas grass when grazing. (A rectangular field is generally better than a square one because of the shorter lengths of fencing required to furnish the breaks).

(e) Sufficient shelter, especially where winter utilisation is envisaged.

These conditions represent the ideal, but not every farm has a suitable layout. This, however, should not deter farmers from commencing a pampas grass plantation. Many valuable areas have been established under less favourable conditions. As a guide to the selection of a suitable site for a

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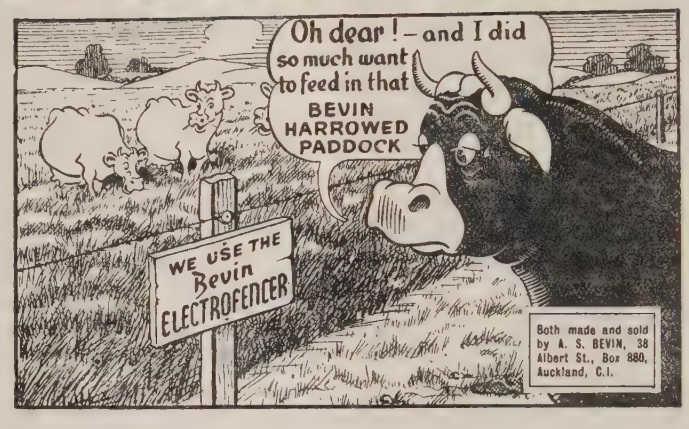
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Fig. 1.—Pampas seedlings, two months after being set out. This area contains sufficient seedlings to plant 6 acres. Allowing for headlands about 1000 plants are required per acre.

Fig. 2.—Part of nursery illustrated in Fig. 1 five months after seedlings first set out, and just before they were transferred to permanent plantation. Note the growth made during the period.

pampas grass plantation, prospective growers are earnestly recommended to make a study of the preceding paragraph.

Cultivation

Having selected a suitable site, the next step is thorough cultivation—in fact this work cannot be done too well, for the future value of the plantation is mainly dependent on growth made by the pampas grass in the first 12 months subsequent to transfer from nursery rows. If growth is vigorous, as it should and can be, then all is well; if retarded, with plants looking obviously unthrifty, then trouble may be expected.

Following cultivation the area requires marking out into 6 ft. rows, lengthwise and across as illustrated in Figs. 3 and 4. This procedure greatly facilitates weed control by enabling cultivation between the lines of pampas from at least two directions. Quite apart from weed control, however, the regular stirring up of the soil in this manner naturally hastens the development of the pampas grass, and thus reduces the period of waiting between the time of transplanting and the first feeding off.

Transplanting

Several devices for lining out may be employed, but the best one for relatively small areas (up to several acres) is that constructed along the lines of a large rake with the prongs replaced by two or four pointed pieces of wood which act as markers. When lining-out in one direction is completed, cross-lining at right angles will then produce approximately 1000 intersections per acre, at each one of which a generous sized hole (9 inches across) should be dug to accommodate the pampas grass transplants.

The work of transplanting from nursery rows to permanent position is slow and monotonous because of the care necessary to ensure that the rooting system of plants is not unduly damaged by breakage or excessive drying out. To overcome this tendency to root damage it is inadvisable to lift too many plants at one time. The transfer of plants should be made under cover of a wet sack. All excessive leaf growth above 15 inches from crown should be removed before plants are lifted from nursery rows.

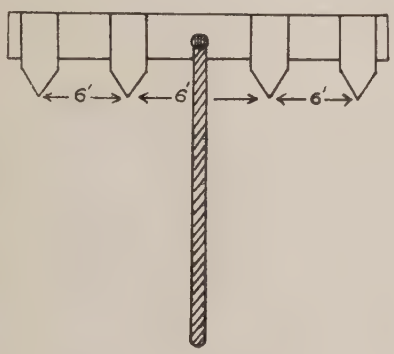

Illustration of lining out device.

Before actually setting plants in the positions prepared for them a generous handful of blood and bone manure, dried blood, or meat-meal should be well worked into the soil at the bottom of each hole. This encourages quick establishment and a steady, healthy growth.

When inserting the young transplants in the hole some care is necessary to ensure that the roots are well spread out, and not just bundled together in a tangled mass. If this is not done failure will most likely be the result. Also make certain the crown of the plant is not buried too deeply, otherwise it may rot at ground level if much wet weather is experienced before the plant is again well started into growth. Finally, the soil drawn in around the roots of plants requires to be moderately tramped to ensure sufficient consolidation to encourage fresh root formation. In this operation discretion will have to be exercised to make allowance for differences in soil characteristics and climatic conditions.

The proper time to plant out pampas grass in the different districts cannot be stated in exact terms owing to the many and varied factors that govern this operation. Farmers who contemplate the growing of pampas grass will, with a full knowledge of their local conditions, have to decide for themselves the best season to undertake this work.

Pampas grass is tolerant of a wide range of soil and climatic conditions, consequently over a large part of the Dominion it may be planted either in the spring or autumn. Where winter conditions are particularly rigorous it is advisable to plant seedlings in a sheltered position in the autumn, and transplant in permanent site during the spring when most of the frosts are over. Where the winter season is relatively mild, but the summer hot and dry for prolonged spells, it is advisable to get the plants well established before that time by planting out permanently in the autumn.

First Grazing

The first grazing of pampas grass will naturally be governed by its development, and this in turn will be influenced by those factors responsible for plant growth—mainly, soil fertility, weather conditions, and the general care bestowed upon the crop. The more, therefore, that can be done to bring about these conditions the sooner will a pampas plantation be ready for feeding off.

This contention is clearly illustrated in Figs. 3 and 4, which show two six-acre pampas plantations in the Bay of Plenty 15 months after transplanting, when pampas was grazed off for the first time. Although the

Fig. 3.—Layout of permanent pampas plantation in rows spaced 6 feet apart. The area is also lined out in a cross-wise direction. Good cultivation in the early stages of establishment is only possible if care is given to lining out.

Fig. 4.—Similar to Fig. 3, but giving a clearer idea of the accuracy of cross-lining as a means of facilitating inter-row cultivation. Both plantations in Figs. 3 and 4 were planted at the same time and grazed 15 months later. Photographs taken after first grazing.

soil on these particular farms was of a moderately light nature and tended to dry up in the summer, good methods of management succeeded in overcoming these serious disadvantages.

To obviate the possibility of injuring plants whilst still young, pampas grass should not be grazed too hard at the first feeding off. If this warning is heeded it will be found that the pampas actually appears to benefit from the pruning provided by the grazing animal.

Sound Practice

Actual experience proves that the growing of pampas grass is a perfectly sound practice for adoption by the average farmer where soil and climatic conditions are suitable. The feed produced from a healthy plantation is immense in quantity, and is relatively high in nutritive value. When once established it is a great labour saver, and this aspect should particularly appeal at the present time when farm labour is in such short supply.

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TREE-TOMATO CULTURE

THE tree-tomato (*Cyphomandra betacea* Sendt) is a useful semi-tropical fruiting shrub belonging to the family *Solanaceae*. Its natural habitat is Brazil.

The fruit matures during the winter months (May to October), and is useful for many purposes. It may be eaten whole or cut up and used in fruit salads; stewed or made into fruit pies; added to a lettuce salad or taken with cold meat; or may be made into jam, pickles or sauce.

The fruit should be peeled before being used, as otherwise a very bitter flavour is present. The skin may be removed without difficulty if the fruit is dipped into boiling water. It comes away as a very thin layer and the amount of waste is negligible. The fruit will keep for several months after picking, and when stored in a draught-proof place it does not wither.

Varieties

There are two main types of tree-tomatoes—the yellow and the red.

The yellow-fruited type is the oldest in cultivation, and has a yellow to orange skin and yellow flesh and seeds.

F. SYDENHAM,
Assistant Horticulturist,
Wellington.

(Now on Active Service)

This type matures later in the season than the red, its greatest production being in July.

The red-fruited type (commonly called black) is of comparatively recent introduction. The skin is dark purplish red, the flesh yellow to orange, and the seeds are dark. When the fruit is stewed the dark red pigment penetrates into the pulp. It is frequently possible to pick three-quarters of the crop in May and June.

Climate and Soil

It is only where soil and climatic conditions are entirely suitable that the tree-tomato can be grown satisfactorily as a commercial crop. The plants are very tender. One or two slight frosts during the winter may not do much harm, beyond destroying the upper foliage. This frost-damaged foliage, however, soon falls, and if late or heavy frosts occur they penetrate the tissues of the plant and damage the young wood. The leaves are large and not suited to windy conditions. For successful culture, therefore, adequate shelter is necessary.

A fertile, light, drained soil is required. The plant at all stages of growth is very susceptible to wet conditions, and these must be avoided. Water lying in the soil for even a few days may kill the plants.

Propagation

Tree-tomatoes may be propagated from seed or from cuttings. Plants grown from cuttings carry many branches from the ground-level, and, as a consequence, develop into low-branched plants. A drawback of plants propagated by this method is the difficulty of cultivation. Cuttings 12 to 18 in. long, taken with a heel of the branch from which they arise, or cut off square immediately below a node and set firmly half to two-thirds of their length in gritty, drained soil, strike without difficulty. They may be taken in the autumn or early in the spring. The cuttings may be planted directly where they are to be grown. It is not uncommon for the cutting to flower and bear fruit in the first year, but this should not be permitted.

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The tree-tomato plant grown from seed bears one main stem, and in this respect is an easier plant to manage. The seed used should be taken from tree-ripe fruit of a tree selected for both productivity and desirability of type of fruit. While cuttings produce fruit identical to that of the parent tree, some variation occurs in the type of fruit produced by trees raised from seed.

Seed should be sown in boxes early in spring and pricked out 1 ft. apart into nursery beds in October or November, where they remain until the following spring. By that time they should have made 2 to 3 ft. of growth and will require wrenching several weeks before being moved to a permanent position.

Planting

September to November is a suitable time to plant. Where the crop is grown in a relatively sheltered position, the spacing of the plants 8 ft. apart in rows 14 to 15 ft. apart is not excessive. Within the rows the trees interlock to some extent, and from the fifth year onwards, when grown on fertile land, they touch between the rows. This method of laying out affords adequate space for cultivation and handling the crop.

Where the plantations cannot be adequately protected from winds, a closer planting is necessary, so that the plants may to a large extent protect one another. Under such conditions allow 8ft. to 10ft. between the rows and 5ft. to 6ft. between the plants.

Good drainage is most essential, otherwise results are most likely to be disappointing.

Treatment After Planting

Clean cultivation during the winter to promote growth and development as rapidly as possible is desirable, and should be continued during the spring and early summer. It is advisable to stake the young trees so as to prevent any swaying that may disturb the rooting system. Intercropping is not recommended.

Manuring

Tree-tomatoes, grown on fertile land, require little or no manure before the fruiting stage. When the peak of fifth or sixth year, a fertiliser composed of 2 parts superphosphate, 1½ parts nitrate of soda and 1 part sulsulphate of potash should be applied in the late winter or early spring at the rate of 10 to 16 cwt. per acre (2 to 3 lb. of the mixture per plant).

The growing of green crops for ploughing into the soil is possible only in the early years before the ground is completely shaded by the foliage of the trees.

Pruning

The tree-tomato makes very vigorous growth, especially in the early stages. It is often advisable to stop the seedling plant 3 ft. or 4 ft. from the ground to encourage the development of a number of branches about this level. The plants grown from cuttings require no pruning in the early stages, as they are usually adequately furnished with low branches, and "stopping" only encourages the production of more.

Established plantations require a considerable amount of pruning. This should be done in the early spring after the crop has been harvested, and about the time the spring growth commences. The aim in pruning should be to maintain as large a proportion of young wood as possible. To achieve this the old wood should be thinned out, and/or cut back to encourage the development of new wood.

Strong branches, which frequently appear from the trunk of the plant at or near ground level, should be retained, as they develop to take the place of some of the older wood.

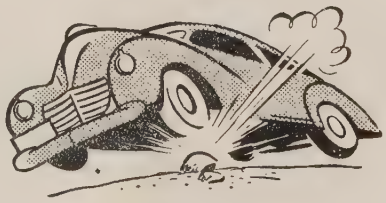
Diseases

Tree-tomato Mildew (*Erysiphe* sp.): This is a powdery mildew common on tree-tomato foliage in New Zealand. Where the plants are heavily infected defoliation occurs; but the disease can be controlled readily by spraying with colloidal sulphur (40 per cent.) at 3 lb. to 100 gallons of water (½ oz. to 1 gallon).

Sclerotinia disease (*Sclerotinia sclerotiorum*): This disease has been recorded as attacking tree-tomato plants. It is not serious on this host, especially if the plants are well spaced and the ground cultivated frequently to keep down weeds.

STEER CLEAR

of the bumps, and your tyres will give you more mileage!



• Few things can do as much damage to the inside of a tyre — even a new one — as hitting a sharp obstacle in the road, or running up over a kerb.

Drive carefully, watch the road, and steer clear of the bumps. If you do, your tyres will repay you handsomely in terms of longer mileage.

GOODYEAR TYRES

Onions and Their Storage

ONIONS are members of the lily family grown for their bulbs, and have a more or less characteristic odour and flavour. They have been cultivated for many centuries for use as vegetables for pickling and for seasoning for other food materials, especially sauces and soups. In the United States of America they are dried in the form of flakes and ground into powder for this purpose also.

From a commercial standpoint onions are an important food crop, and rank in value next to potatoes, tomatoes and cabbages. There are a number of varieties of onions grown in New Zealand, of which the most suitable for long storage is the Turbott or Pukekohe Longkeeper.

Onion Rots

Onions are subject to disease during their growth, and also to rots which develop during harvesting and storage. They are also subject to blemish and bruising which renders them susceptible to the invasion of bacteria and moulds.

During the harvesting, transit and storage of onions neck rot is a serious onion disease, and is caused by *Botrytis* rots, which will bring about heavy losses if the stem tissues are not properly dried out.

Trials to be carried out in the coming season at Marshlands, Christchurch, will include forced drying with heat of onions immediately after harvest, to determine whether this will control the development of neck rot and other rots during storage.

Sunny, dry weather is ideal for drying onions, as under these conditions the moisture given off by the skins and stem tissues evaporates quickly. High humidity brings about the condensation of moisture with the added possibility of rot development. Rainy weather is detrimental to both harvesting and drying in the field. Since decay is such an important item in onion raising, care should be practised in destroying diseased bulbs and tops after harvesting.

Selection For Storage

Only sound, well-formed bulbs which have been properly cured should go into storage for use late in the season. That part of the crop which is not of the quality for long storage, but suitable for immediate consumption, should be marketed without undue delay after harvesting and curing.

Well ventilated crates, as illustrated on page 27 of the January issue of the "Journal of Agriculture," are the most suitable containers for the curing and the successful storage of onions, as they conserve storage space by permitting high stacking without causing pressure on the bulb. They also allow ample ventilation throughout the onions if the crates are properly stacked.

Essential Factors

Temperature, humidity, air circulation and ventilation are the four essential factors in the successful storage of onions. Temperatures of 32 deg. F. and from 60 deg. F. to 95 deg. F. have been found to retard sprouting of sound onions during storage. When held in heat storage at 74 deg. F. and 70 per cent. relative humidity, root growth is reduced to a minimum.

The results of a commercial trial with heat storage which was carried out at Marshlands, Christchurch, during the past season indicated that sound onions after removal into ordinary atmospheric temperatures will not readily develop sprouting or root growth, thus allowing ample time for marketing and consumption.

—A. A. POWELL, Cool Storage Officer, Wellington.

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Veterinary Notes for the Farmer

The Clinical Symptoms of Tuberculosis in Cattle

IT is important to be able to recognise a cow suffering from tuberculosis. First, a cow showing clinical symptoms usually has the disease in an advanced stage, and in such a condition is not only a danger to public health but also to the rest of the herd. Secondly, tuberculosis is a notifiable disease under the Stock Act. Although most farmers have a fair idea where to look for signs of tuberculosis, one still meets with some rather confused ideas on the subject.

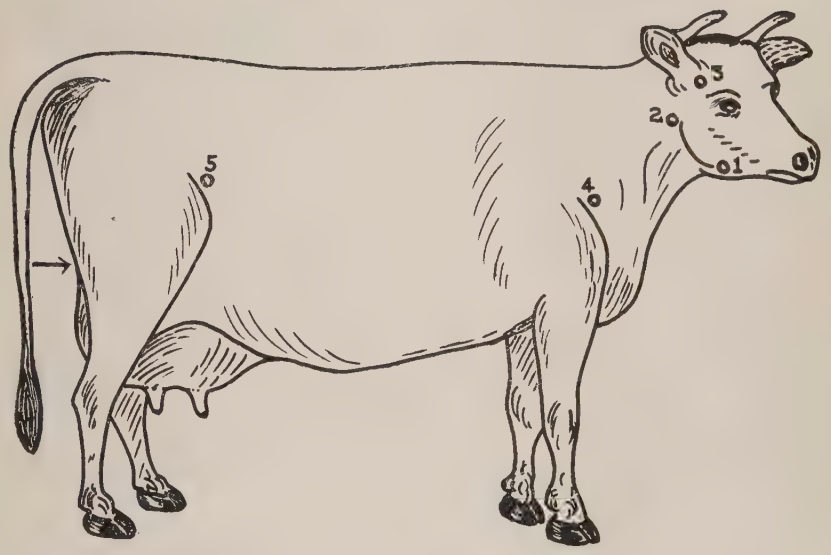
Only a small percentage of infected animals show clinical symptoms. A cow may in fact be quite badly infected and seem healthy to all outward appearances, although sooner or later, especially under the strain of intensive milking, symptoms appear. Fortunately, however, we have in the tuberculin test a very sure means of diagnosing tuberculosis in all stages of infection. The incidence of the disease increases with age, being uncommon in calves under one year and commonest in old cows.

Lymph Glands

As tuberculosis is primarily a disease of lymph glands it is necessary to know something about the position of these to understand the clinical symptoms. The lymph glands are situated in various parts throughout the body. Most of them are internal and cannot be seen or felt. Others are quite superficial and can be readily examined. The position of the superficial lymph glands is shown in the accompanying diagram:—

The **submaxillary** glands are situated at the corners of the lower jaw, one on each side. They are slightly larger than a walnut in size. They can be readily felt, and in fact can be seen as slight swellings in the normal animal, especially when the neck is extended while grazing.

The **pharyngeal** glands are situated deep in at the back of the throat and cannot be felt unless enlarged. When enlarged they cause the symptoms described later.



SUPERFICIAL LYMPH GLANDS OF THE COW.
1. Submaxillary. 2. Pharyngeal. 3. Parotid. 4. Prescapular. 5. Precrural.
The arrow indicates the position of the mammary lymph glands.

The **parotid** glands are situated a little below and slightly in front of the base of each ear.

The **prescapular** glands are situated about a hand's breadth above and in front of the point of each shoulder. Each is oval in shape, about four inches long, and if the fingers are passed over the skin can be felt slipping beneath them.

The **precrural** glands are situated in the flanks just above and in front of each stifle. They are similar in size and shape to the prescapular and can be easily felt.

The **mammary** glands are situated above the two hindquarters of the udder and are not easily felt unless enlarged.

Tuberculosis of the lungs and generalised tuberculosis: Tuberculosis of the lungs is the commonest form in older cattle. The beginning of the disease usually passes unnoticed as it is slow and insidious. When the lungs are involved a dry short cough is noticed, especially after exercise. The cough may later become very troublesome to the animal. Discharge from the nose is rare or absent. In calves coughing is nearly always due to lung worm infection, but in older animals a chronic cough, especially with loss of condition, is very suspicious of

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tuberculosis. The general effect on the body is at first slight. In fact, animals may remain in good flesh for a considerable time. Infected cows are frequently removed from the herd for other reasons before symptoms appear. Invariably as the disease progresses there is loss of condition. The coat becomes dry and staring, and the skin hidebound. In the advanced stages the animal has a debilitated and tucked up appearance generally.

Tuberculosis of the throat region: This is the commonest form in young animals, and is also often present in older cows, either alone or together with infection in other parts. An infected submaxillary gland appears as a rounded firm swelling which is freely movable beneath the skin and strictly confined to the gland. The swelling develops slowly over a period of months, and shows no tendency to rupture and discharge. One or both glands may be infected. In abscesses of this region, which are not uncommon, the swelling usually develops rapidly and commonly ruptures and discharges. In this case it is more ill-defined, as the soft tissues and the skin are often involved.

Another condition which may be confused with tuberculosis is lumpy jaw. Here the bone of the jaw is usually involved as well as the surrounding soft tissues, although the gland may also be infected. In the case of lumpy jaw the swelling commonly ruptures and discharges at several points.

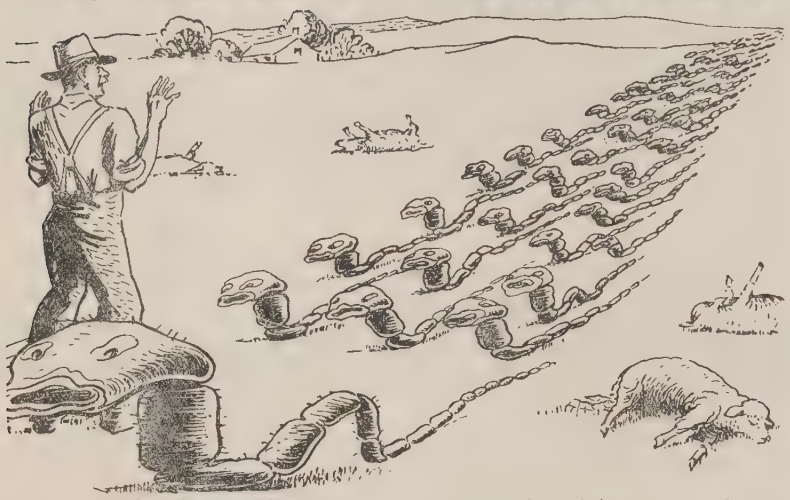
Tuberculosis of the pharyngeal gland at the back of the throat is more common than that of the submaxillary gland, but is much more difficult to detect in the early stages. It is only when the gland is considerably enlarged that symptoms appear. The animal then holds its head and neck stretched out in a typical manner, and the pressure interferes with breathing and causes a snoring noise.

Tuberculosis of other superficial lymph glands. Infected parotid, prescapular and precrural glands may be seen as lumps bulging beneath the skin. Enlargement of these is often a sign of extensive infection internally. It is important to know the position of these glands, as lumps in any other parts of the body are not likely to be due to tuberculosis.

The early removal of all clinical cases helps to keep down the incidence of tuberculosis, and in any suspicious case application should be made to have the cow tuberculin tested.

—A. G. BRASH, B.V.S.C., Veterinarian, Christchurch.

ONE WORM TODAY MEANS *Millions* TOMORROW



Unchecked, a female worm lays up to 30,000 eggs a day. The menace of worm infestation can grow to costly proportions, reducing both the weight and quality of carcase and fleece and resulting in loss of stock. Act promptly in combating parasites by drenching regularly with Giesen's and Sutton's—proved and tested drenches which grow in popularity year after year.

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Cobalt Deficiency in Sheep and Cattle

As the result of investigations into the prevention of bush sickness by the use of cobalt, it is now possible to recommend to farmers in the districts concerned, methods by which they can economically prevent the incidence of the disease. These recommendations are made jointly by the Department of Agriculture and the Cawthron Institute, and are available in a bulletin issued free by the Department.

Answer to Correspondent

Middle-Ear Disease in Pig

"V.J.R." (OTOROHANGA):—

I have a sick pig aged three months which, although not appearing to be in pain, goes about with its head on the right side, that is, with the right ear lower than the left. It is a little weak, but runs about and has quite a good healthy appetite.

LIVESTOCK DIVISION:—

The symptoms described are consistent with what is known as middle-ear disease in young growing pigs. This is due to abscess formation in the middle ear, and has been described as due to vitamin deficiency in the young growing animal. Although the diet of the pig is not given, it is advisable to give the pig access to young leafy pasture containing clover. It is also advisable in this case to supplement the diet by the addition of cod-liver oil to the milk or other feeding stuff. About two tablespoonfuls of cod-liver oil should be added to the feed night and morning for a period of several weeks to build up the vitamin deficiency.

It will be necessary to discontinue the use of the oil a few weeks before slaughter, in order to prevent tainting of the meat of the animal at slaughter. Although the use of cod-liver oil or other vitamin-rich food is excellent in preventing these cases, it is more difficult to cure a case when the abscess is already in existence. However, access to green pasture combined with cod-liver oil will build up the constitution, enabling the animal to throw off its present weakness and overcome the ear trouble. If the present weakness is neglected, the animal will later develop paralysis of the hind-quarters.

Advisory Service on Veterinary Matters.

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Farm Practice and Management

Pasture Management with Less Fertiliser

WARTIME conditions have brought about a reduction in the quantities of fertiliser available for top-dressing pastures. A reduction in pasture production will inevitably occur on many farms. The good farmer, in order to maintain his production at the highest possible level, has given serious consideration to all ways and means of ensuring that the feed available for his stock is ample. Examples of changes in management already noticeable are the increases in the areas of root and forage crops, and particularly in some districts, the utilisation of liquid farmyard manure.

The farmer who provides extra reserves of fodder for periods of poor pasture growth will be in a happier position than his neighbour with little or no reserves. Even with less fertilisers, pastures will produce more stock-feed than can be used by the stock on hand at the time when the feed is ready for grazing. Surplus feed should not be wasted, but made into hay and ensilage, and conserved for later use. Difficulties regarding labour to make hay and ensilage may occur, but no thoughtful farmer who can make the necessary arrangements will intentionally waste that which nature freely provides above the immediate requirements of stock.

Topping Pastures

Even where ample areas are cut on the farm for hay and ensilage, a favourable growing season will result in feed remaining unconsumed. Thus, instead of all the pasture area producing the fresh, leafy pasture so desirable for milking cows, the tendency will be for portions of the fields to become tufty and stemmy. It is sound policy even when other jobs on the farm require so much personal attention, to top the pastures with the mower. If left untopped, valuable feed is wasted, and the ill effects remain for many months, even into the next season. The longer the necessary topping of pastures is left, the poorer the results. Topping should be done early enough to allow of the development of a fresh growth before the hot summer weather sets in, and should not leave the sward so short as to bring about injurious drying-out of the ground. Topping which involves the close mowing of pastures plants would be especially undesirable just prior to the dry spell usual in many districts during the summer.

Grazing Management

The avoidance of waste by making the seasonal surplus into hay and ensilage for feeding stock during seasonal shortages, and the removal of possible less-nutritious feed by topping are only two of the aids in maintaining the pastures in the vigorous, leafy condition that should be the grazier's objective. Even in normal times they are largely ineffective if not linked up with skilful manipulation of the grassland farmer's principal tool—the grazing animal. To-day it is more important than ever that the grazing management of pastures should be of the highest efficiency. Strict attention should be given to the grazing management, and care taken to see that the pastures are not grazed too close, nor allowed to grow too rank at any one period of the year.

High butter-fat production per acre can be obtained only by having reasonable subdivision, resulting in the fields being of an equal grazing capacity, and small enough to enable the feed to be eaten down rapidly without waste. Fields should then be closed for the necessary spell to recover, and provide suitable feed for the next grazing.

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The manipulation of grazing stock is a personal matter for the farmer. On many farms much improved grazing management could be achieved with little or no alteration in their layout, and little or no additional expenditure. The advent and success of the electric fence means that temporary and permanent subdivisions can be put in as required at the minimum cost.

Even though labour is short and fully occupied on farms, consideration must yet be given to the practice of harrowing of pastures, especially to spread animal droppings, which, if left untreated, result in wasteful, rank, and patchy growth.

Without adequate fertilisers maximum pasture production depends on more intensive management practices. Briefly, these practices result in the avoidance of waste of that which is already on the farm. The whole question is one of personal consideration and thought by the farmer. The result of applying the best practices still available to-day will considerably alleviate fertiliser deficiencies.

—E. H. ARNOLD, Instructor in Agriculture, Dargaville.

Why Lift Cans the Hard Way?

A 16-GALLON can of cream weighs about 200 lb. To lift this direct on to a cream stand requires considerable strength, and may easily result in a serious strain. For women and boys, even with a 12-gallon can, such a feat is practically impossible, and merely to try it may be exceedingly dangerous.

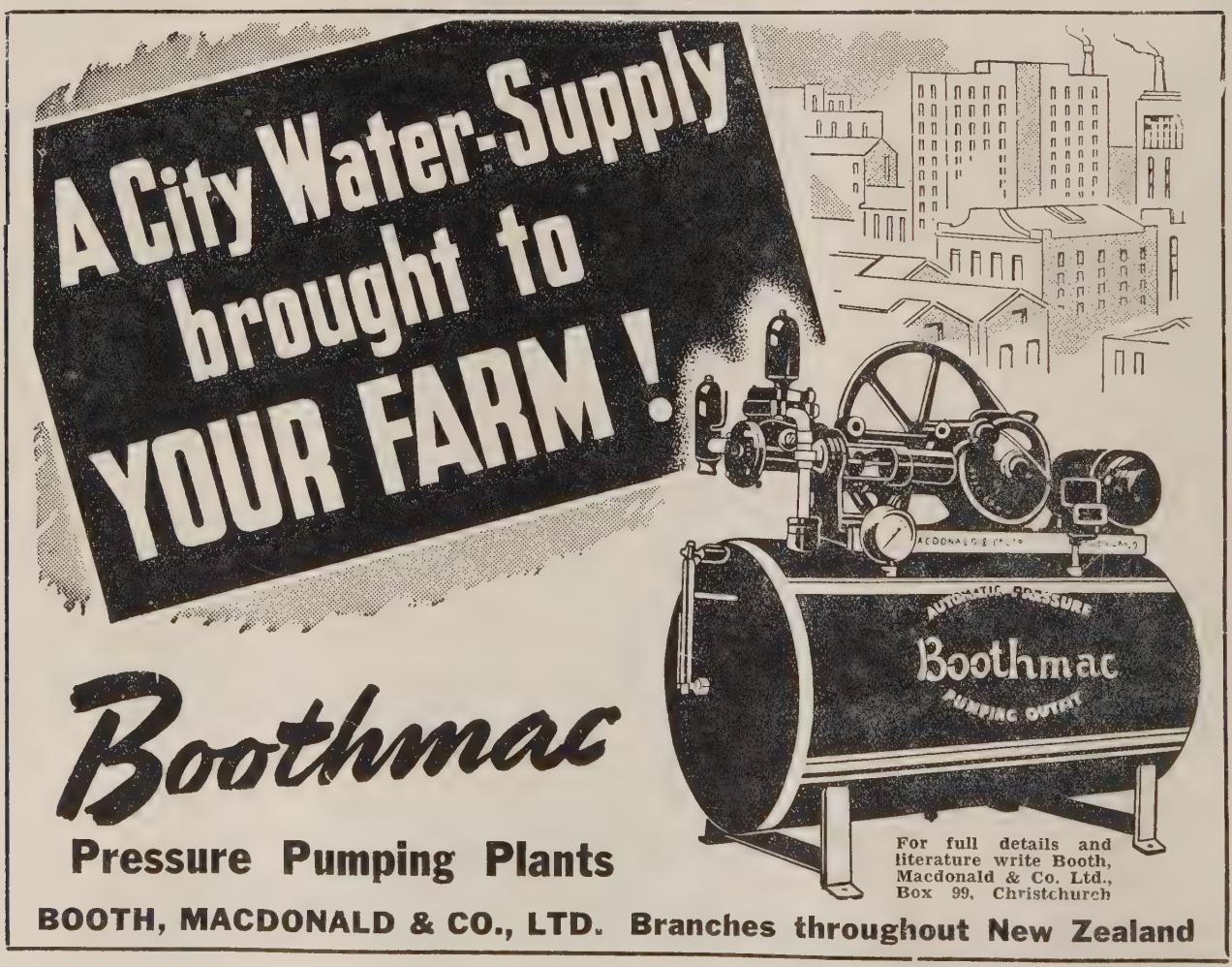
Realising that it is not always necessary to do things the hard way, a farmer in the Helensville district recently sought for an easier method—and found it. The solution was, after all, perfectly simple, and even the necessary gear was already to hand lying idle on the farm.

The accompanying illustration shows the construction of the hoist. The gear is mounted on a swivel upright. When the can has been lifted to the full height it is held safely by a ratchet and the whole outfit can be swung round till the can overhangs the stand.

In these days, when much of the farm work is necessarily performed by women or boys, such a hoist is particularly useful. Fitted with a non-slip

ratchet, it is both safe and easy to operate, and in an emergency—as has already been demonstrated—a woman can lift a 12 or 16-gallon can from the sledge to the platform without strenuous effort and without the slightest risk of strain.

—P. S. SYME, Instructor in Agriculture, Warkworth.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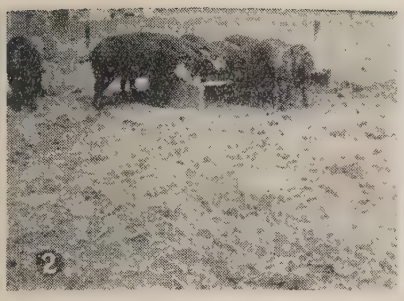

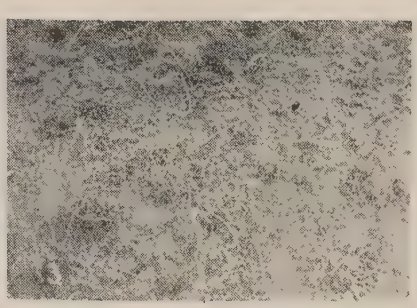

Photos above:—

Fig. 1.—Pig pens set up on kikuyu grass areas allow pigs rooting of the runners to the surface to be left exposed to frost and sun. Pens on right showing no signs of recovery.

Fig. 2.—Kikuyu grass runners in foreground freshly rooted out by the pigs.

Fig. 3.—Kikuyu grass runners rooted out by pigs and left on the surface exposed to frost and sun.

Control of Kikuyu Grass

SOME years ago our attention was drawn to the value of kikuyu grass on unconsolidated sand dune country, and on slips in hilly country in the warmer areas. At a later date attention was drawn to the potential danger of such a grass on the more fertile areas. The worst is now happening, and some of the fertile areas in the Bay of Plenty are in danger of this pernicious spreader gaining control; in fact, some of the fine pumiceous sandy soils are already dominated by it.

Since spreading takes place by the runners throwing out new root systems at each joint, it is in the nature of an excellent twitch. This, together with the fact that it is transported by the feet of stock from one part to another, enables a rapid establishment which is beyond practical control. On loose soil which is reasonably fertile it makes great headway, and soon takes up a dominant role in the sward, to the detriment of the other grasses, and particularly the clovers.

At the moment, control by pigs is being watched with interest, and results to date have so far been quite satisfactory. Control pens about half a chain by one chain (*see Fig. 1*), were set up on the affected area, and concentration of pigs on each pen in turn allowed a thorough rooting up of the ground to take place. Although the Kikuyu grass runners were not eaten, they were left in pieces on the surface as shown in *Fig. 3*. After a few weeks exposure it was found that the frost, and other elements had completed the job of destruction. On examining a well-rooted area after ideal

growing conditions not one live runner could be found. On an area which had not received quite so much rooting by the pigs, there was evidence of some of the runners being still alive. The areas so treated were to be ploughed for cropping purposes.

However, at this stage it is of interest to bring this method of control under notice even though no definite conclusions can be drawn as to its complete success.

—J. R. MURRAY, Instructor in Agriculture, Whakatane.

Radio Broadcasts

ARRANGEMENTS have again been made for radio talks to farmers to be delivered from Station 1YA, Auckland, at 7.15 p.m. on each Monday as from March 15. The following is the programme for the coming month:—

March 15.—"Some Comments on the Farming Position," by Mr. J. M. Smith, Fields Superintendent, Department of Agriculture, Auckland.

March 22.—"Young Farmers' Clubs' Session—Presidential Address," by Mr. D. S. Ross, Dominion President, Young Farmers' Club's Federation.

Pig Industry Broadcasts

UNDER the auspices of the District Pig Councils concerned broadcasts will be delivered in March as follows:—

1YA, Auckland, March 18, 7.15 p.m.—"Autumn Feeding," by H. E. Clark, Supervisor, Auckland District Pig Council.

2YA, Wellington, March 16, 8.30 p.m.—"Winter Feeding," by C. H. M. Sorensen, Supervisor, Taranaki District Pig Council.

2YH, Napier, March 11, 7.30 p.m.—"Equipment that Makes Pig-keeping Easy," by I. H. Owtram, Supervisor, Tairawhiti District Pig Council.

3YA, Christchurch, March 18, 7.15 p.m.—"Litter Production," by Hector McIntosh, Supervisor, Canterbury District Pig Council.

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Slaughterings of Stock

THE following returns of slaughterings of stock at meat-export slaughterhouses and abattoirs for the months, May to December, 1942, have been compiled by the Livestock Division:—

District.	Cattle	Calves	Sheep	Of which Ewes were	Lambs	Pigs
North Island.						
Meat-export Slaughterhouses—						
Auckland	144,965	581,966	69,229	40,188	547,232	138,839
Poverty Bay-Hawkes Bay	37,515	55,962	130,752	85,173	815,723	12,766
Taranaki-Manawatu ..	66,197	208,917	30,866	19,980	469,371	73,221
Wairarapa-Wellington ..	28,712	22,799	52,903	22,413	348,180	14,415
Totals	277,389	869,644	283,750	167,754	2,180,506	239,241
Abattoirs	86,598	25,628	407,407	181,814	69,166	80,927
North Island Totals ..	363,987	895,272	691,157	349,568	2,249,672	320,168
South Island.						
Meat-export Slaughterhouses—						
Nelson-Marlborough ..	1,366	10,723	7,521	5,244	42,873	4,321
Canterbury-Westland ..	8,705	35,320	111,574	80,120	519,198	17,131
Otago-Southland ..	8,279	37,959	61,910	49,942	597,955	4,011
Totals	18,350	84,002	181,005	135,306	1,160,026	25,463
Abattoirs	63,132	15,723	295,935	151,969	50,716	30,569
South Island Totals ..	81,482	99,730	476,940	287,275	1,210,742	56,032
Dominion.						
Meat-expt. Slaughterhouses	295,739	953,646	464,755	303,060	3,340,532	264,704
Abattoirs	149,730	41,356	703,342	333,783	119,882	111,496
Grand Totals	445,469	995,002	1,168,097	636,843	3,460,414	376,200
Same Period, 1941— Meat-export Slaughterhouses and Abattoirs ..	333,717	980,352	1,154,417	630,916	4,198,650	462,735
Same Period, 1940— Meat-export Slaughterhouses and Abattoirs ..	372,837	1,011,262	1,257,520	755,084	3,226,707	421,384

Slaughterings of Pigs

The 84,947 pigs slaughtered at meat-export slaughterhouses and abattoirs during the month of December, 1942, were distributed in weight ranges approximately as follows:—

Up to 60 lb.	252
61 to 120 lb.	19,693
121 to 160 lb.	43,165
161 to 180 lb.	16,222
Over 180 lb.	2,784
Sundries	2,831
	84,947

The grading of porkers was 92 per cent. of 1st quality, 8 per cent. of 2nd quality, and that of baconers was 75 per cent. of Prime 1's, 20 per cent. of Prime 2's, and 5 per cent. of 2nd quality.

In the different weight ranges of baconers the grading was as follows:—

121 to 160 lb.	79%, 17%, 4% of P1's, P2's and 2nds respectively.
161 to 180 lb.	65%, 27%, 8% of P1's, P2's and 2nds respectively.

Orchard Notes

Treatment of Fireblight Disease

EVERY effort should be made to place fruit in the hands of the consumer in the best possible condition. Fruit at its prime is its own salesman, and an increased demand can be expected if the consumer is receiving fruit when at its best. Much can be done by the grower to assist towards this end, and the following hints should be noted:—

Make two pickings of each variety. Pick carefully. Keep the fruit when picked out of the sun. Fruit held in the shed should be in a cool, well-ventilated position. After picking handle fruit expeditiously. Keep the shed free of rejects and rotting fruit. Keep the sizing-machine clean. Provide ample light for grading. Consolidate pack and keep ends of pack almost level with case to avoid bruising when nailed up. Despatch fruit promptly after packing.

Fireblight

Fireblight is a bacterial disease caused by *Erwinia amylovora*. It overwinters in a more or less quiescent condition in large cankers on pear, quince and hawthorn trees.

The danger period occurs in spring with the renewal of sap movement, when the organism again becomes active and small masses of ooze exude from the overwintering cankers. This ooze is at first a sticky water-coloured fluid which gradually dries to a stiff resinous mass, amber in colour, and later becoming hard and dark coloured. Insects, especially bees, appear to be readily attracted by the ooze when it first appears, and carry away with them large numbers of the organism. Where these insects visit the blossoms of host trees, blossom-infection is likely to occur on a large scale.

In most seasons the period at which the ooze appears occurs just after blossoming and only the very late blossoms may become infected, but in some seasons, possibly due to early sap movement, the organism is active at an earlier period, and ooze appears coinciding with blossoming. Blossom-infection then becomes rapid and extensive, due to the activities of bees and other insects, which not only cause the initial spread from ooze to blossom but from blossom to blossom.

Sucking insects are able to carry the organism in their mouth parts, and should they feed on soft tissues of young shoots after having visited infected shoots infection is likely to follow. Bronze beetles are common agents in the spread of shoot infection.

Pear Trees

Infection is liable to spread rapidly in pear trees, the organism quickly travelling from infected blossoms or young shoots to the heavier branches, where large cankers may be formed, and these may soon girdle branches which then die. Infection of pear trees is usually a serious matter, especially the initial attack of fireblight sustained by the tree. Infections in subsequent years seldom reach the virulency of the initial outbreak, leading to the belief that following the initial infection the trees become partly resistant.

Apple Trees

On apple trees, only blossom and twig infection is likely to be prevalent, branch cankers being very unusual. The spread of the organism appears to cease when the larger branches are reached. Serious loss of crop, however, may follow early blossom infection.

Treatment

In the treatment of the disease especial attention should be paid to pear and quince trees showing infection, and every effort should be made to cut out and destroy infection as promptly as possible. On the laterals and lighter branches the cut should be made well below the point of visible infection, and the wound swabbed with acidulated mercuric chloride* and then coated with a protective covering such as bitumastic paint. To prevent spreading infection all tools should be dipped in a solution of formalin 1 part to 100 parts methylated spirits.

In the past, blossom and twig infection on apples was looked upon seriously, and efforts were made to cut off all infected spurs and twigs. However, there is no known instance of the organism overwintering in apples in this country, and apart from infected fruits which should be picked and destroyed, little attention need be paid to infection on apple trees until the winter pruning.

The destruction of all fireblight cankers on pear and quince trees, and the cutting down of adjacent hawthorn will do much to prevent fireblight infection reaching your trees during the danger period of October.

—R. G. I. HAMILTON, District Supervisor, Horticulture Division, Auckland.

* See Fungus Diseases of Fruit Trees, page 36.

Scale Insects

FOR the eradication of scale insects an oil spray is used (which blocks the tracheae or breathing pores) and thus asphyxiates them. The addition of nicotine will control other insects such as thrips, black-aphis, red-mite and mealy-bug. The spray should be applied in mid-February at a strength of 3 per cent. certified summer oil. This should be repeated three to four weeks later. In the latter spray add nicotine sulphate 1-800 for the other pests listed above. These spray strengths are:—

To each 100 gallons of spray—
3 gallons summer oil.
1 pint nicotine sulphate.
or to each 4 gallons of spray—
1 pint summer oil.
6 teaspoons nicotine sulphate.

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Passion Fruit Culture

THE culture of the passion vine, *Passiflora edulis*, has been undertaken commercially for a number of years in various parts of the Auckland Province.

Ten years ago, on virgin land, passion vines planted at Kerikeri, Bay of Islands, at various localities throughout the Bay of Plenty, and also near Auckland city, flourished. The vine grew profusely, and whilst the fruit was plentiful, easily grown, and readily marketed, advice given with regard to the systematic pruning, spraying and manuring of the vines was often ignored.

This industry, which was once in a thriving condition, is now on the decline, due largely to the incidence of diseases which have wrought havoc amongst the vines. Today, the commercial passion vine grower must be prepared to carry out the maintenance of this vine in a systematic manner if success is to be achieved in its culture. At present it is known that there is a profitable market available in the Dominion if the fruit can be successfully grown.

Situation and Soil

The site chosen should be accessible, that is within easy reach of the rail for transporting the fruit to distant markets or in close proximity to a centre of population. It should also be free from injurious frosts, as the vines will withstand only a few degrees of frost. The effects of frost are not only the killing of the young shoots but also result in the weakening of the vines, which subsequently often succumb to disease.

The passion vine will grow on a wide range of soils, but for commercial cropping requires a light, rich loam with good drainage. It will withstand moderate winds, provided the trellis upon which it is trained is of adequate strength. The site chosen should preferably have a slight northerly slope so that the vines may receive maximum sunshine. Steep or broken country will greatly increase the costs of production.

Preparing the Site

Where necessary, first clear the land of fern, gorse, scrub, stone, etc. Plough the area in the autumn to a depth of between 6 and 9 inches and allow to fallow over winter. At the same time a low shelter should be planted around every two acres to be planted in vines, unless the topography of the area makes this unnecessary. The southern and western boundaries need most protection. The shelter recommended is *Cupressus Lawsoniana, Haken saligna, Acmena floribunda, Berberis vulgaris, Pittosporium crassifolium,* varieties of *Feijoa sellowiana,* or such other hedge as has been proved suitable for local conditions.

Preparing the Soil

The area should be cross ploughed in late winter (August) and an annual crop may then be sown, provided it will be harvested by early autumn (March). The soil should then be disced to a fine tilth and a cover crop of blue lupins, 1½ bushels per acre, plus 4 cwt. of superphosphate should be sown. This leguminous crop should grow over the winter and be turned in by plough or heavy discs before mid-September in order that the area may be worked to a fine tilth prior to October, when the young passion vines should be set out. Although vines may be planted in the previous spring, this is considered inadvisable on newly-broken ground, as all previous experience with virgin soils indicates that thorough preparation of the soil is time well spent. This preparation of the soil, as for orchard establishment, is therefore essential. If this is not done, the suppression of resulting weed growth, following inadequate preparation, becomes an operation of some magnitude. Although roots of the vine have been found occasionally at a depth of ten feet, the vine is generally regarded as surface rooting and its roots will be less injured by the implements of cultivation if the soil has been well tilled prior to the planting of the vines.

Probably one of the reasons for the early success of the passion vine on virgin soils is the higher humus content of such soils. As humus becomes rapidly exhausted by clean cultivation, the annual sowing of "green manuring" cover crops to maintain the humus content of the soil is recommended.

Seed Selection and Propagation

It should be realised that whilst the land is being prepared, the choice of suitable seed and the raising of young passion plants are the most important undertakings of the intending planter.

With all forms of horticulture, it is a well-known axiom—"to propagate only from the best"—yet it is surprising the number of plants which are raised from inferior stock. Choose a well-proven vine, that has cropped consistently with a desirable type of fruit.

A young passion vine shortly after planting.

[I. L. Nottage, photo.

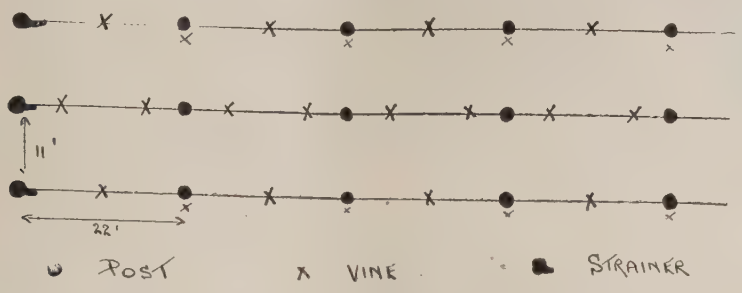
The fruit of the smaller purple form of *Passiflora edulis* is superior to that of the "mammoth" variety, which is often incompletely filled with pulp. It is important that fruits selected for seed purposes should be free from disease.

The seed boxes should have an inch of loose, well rotted, horse manure placed on the bottom; this should be pressed down and three inches of soil added. This soil should be made up of two parts turfy loam, one part leaf mould, and 1 part of coarse, clean sand. The turfy loam is generally obtained by skimming the top four to six inches off an old established pasture. This turf is stacked with the grass down for about twelve months in order to rot and be suitable for use. The soil mixture should then preferably be sterilised by steam and 1½ ounces of basic superphosphate per bushel of soil should be added.

The seed from selected fruits should be separated from the pulp by rubbing with sand and then air dried. It is inadvisable to wash the seed with water. Seed should be sown about the middle of October and covered with good sieved soil. The first seed to germinate should appear in 14 days and the main crop of seedlings should appear 21 days from planting. With a good strike 1lb. of seed should yield 13,000 plants.

Pricking out should be done at the four leaf stage, commencing towards the end of November and being completed by mid-December. The pricking out boxes 12in x 18in should be filled with the usual pricking out soil, with well rotted horse manure on the bottom. Six rows of six young seedlings will generally fill a box. At first the seedlings should be given little water but later adequate watering should be done. By the end of January, the young plants should be

ready to set out in the field if conditions are exceptionally suitable, otherwise hold the plants in the boxes over winter, or they may be planted out in nursery rows. By this system the plants are hardened off and ready for their permanent situations by the following October. When pricking out and transplanting only strong healthy



Passion vine plantation—ground plan. Scale, 1in. to 16ft.

plants should be retained. To provide for annual replacements, however, a grower should always have a box of seedlings on hand.

Trellis

The erection of the trellis or fence upon which the vines are to grow, should, if possible, be erected prior to the planting of the young vines or as soon after planting as possible. If the erection is left too late, the young vines become a mass of tangled canes, which require considerable effort to disentangle; or pruned off, represent lost growth.

The trellis should consist of strong posts, with the base treated with creosote, unless they are of a durable nature, and spaced 22 or 33 feet apart in the rows and 11 feet between the rows. The exact measurements are immaterial, provided a structure is erected which will carry a full bearing crop and allow the passage of cultivation implements between the rows. The posts should be 8 to 9 feet long to allow for two to three feet in the ground and six feet above. Trellises should not be much more than 100 yards in length as long trellises increase harvesting costs. At the end of each row should be a good strainer post with a foot set in by an experienced fencer. Four No. 8 gauge wires, evenly spaced, with the highest strained along the top of the posts and the lowest at least two feet from the ground, forms a suitable framework.

In order to provide vertical support for the passion vine leaders and also to strengthen the trellis, four light tea-tree, or bamboo stakes are required. With the young vine as the point of radiation, four of these stakes long enough to reach from the ground to the top wire should be set in fanwise by each plant. These stakes vitally assist the grower in training the young vine on the trellis. Careful performance of this early training is essential as it is the basis of the permanent framework of the plant. It is inadvisable to use wire netting as the vines soon become too entangled and thus cannot be properly pruned.

The rows of the trellis should run as near north and south as possible so that the ripening fruit may obtain maximum sunshine. To give the vines the maximum rooting surface, vines in adjoining rows should not be opposite each other.

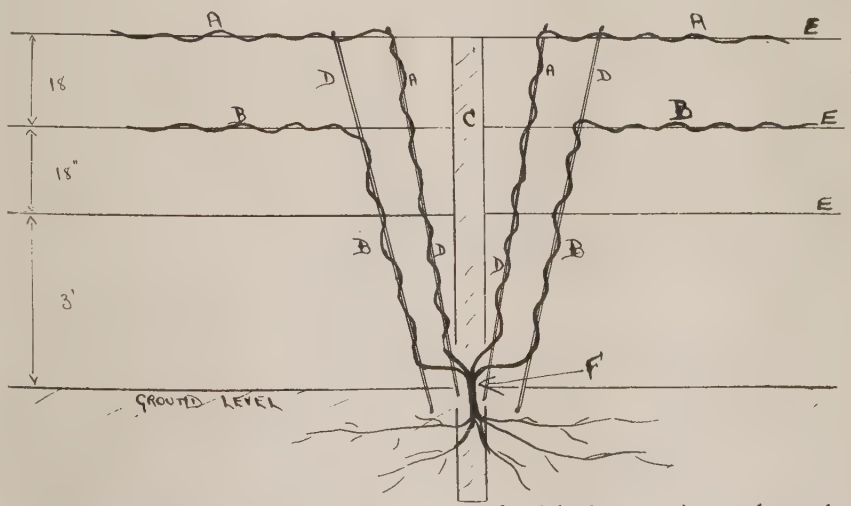
By this system of planting, there will be theoretically 360 vines per acre, but in actual practice, by allowing for headlands, shelter, etc., 300 vines per acre can be considered an adequate average number. If vines are planted closer together, although there will be a larger number per acre, the crop per vine will probably be reduced and the crop per acre be thus unaltered.

Planting

If it is intended to plant two-year-old seedlings, these should be cut back in the nursery, and the roots also pruned by wrenching a few weeks before planting out. The one-year-old plants, which generally strike as well or even better, may be taken straight from the boxes. They will also be more inclined to bear a winter crop two years from the time of planting. Planting should be undertaken in October, after the risks of frosts are over, and before dry weather sets in. Spread the roots carefully when planting and do not allow them to become dry during the operation. During the first few weeks there will be little growth, but by January the vines generally grow rapidly and should be trained on to the trellis at once. Tie lightly with raffia to the framework already prepared.

Training

In training passion vines on the type of trellis suggested, the aim should be to establish a main leader along each of the four stakes that have been attached to the trellis at each station. To reduce a vine to one main leader appears to be a too drastic system, resulting in loss of cropping surface and also leaving the vine too open to hail or other mortal injury. With the young vine making growth choose the four strongest shoots to tie up on to the perpendicular supports and pinch back all other shoots before they exceed three inches of growth so that the four leaders chosen may develop maximum length and thickness during the first season. As each of these four main leaders attains sufficient length it should be twisted lightly round the stakes provided and tied in position. These leaders, as they lengthen, should be trained on to the horizontal wires, the two inner leaders to the right and left along the top wire and the two outer leaders along the second wire. It is important that this work be carefully done as the object is to form the permanent framework of the vine clean and strong. All other shoots



Passion vine trellis—elevation. Scale ½in. to 1ft. The bottom wire can be used to train in secondary leaders, but its best use is to steady the laterals from leaders on wires above it. A: Central leaders. B: Outer leaders. C: Post. D: Bamboo or tea-tree stakes. E: No. 8 wire. F: Vine plant.

Left.—A passion vine trained on to trellis, 18 months from planting. *Right.*—Mature passion vines in well sheltered locality.
[J. L. Nottage, photo.

thrown out by the plant at ground level should be pinched back before exceeding three inches in length.

In the spring following planting, the vines generally make considerable growth and training is required to keep the leaders along the main wires of the trellis. Laterals arising from these leaders will carry flowers and fruit for the new season; any secondary leaders that may arise should be suppressed unless there is a definite place for them.

Pruning

During the following summer and winter the vines should carry a good crop of clean fruit and all growth be young and vigorous. It is in the following spring, namely two years from the time of planting, that the main problem of pruning first arises. The passion vine bears its fruit on the current season's growth; thus, if left unpruned, the bearing surface is further and further removed from the main leaders. As there is no room for unlimited horizontal expansion along the trellis, vines being 11 feet apart, these annual extensions intertwine amongst themselves, the growth of previous seasons, and that of neighbouring vines, until each vine becomes a mass of tangled growth. Unless this is prevented the vine will be short-lived owing to over-cropping and the ravages of diseases which cannot be checked by spraying owing to the denseness of each vine. To prevent this occurring, an annual pruning is necessary. This should be done in the spring months.

It will be noted that along the leaders there are nodes, where new shoots—laterals—arise. Prune off all dead and dying growth, and laterals which have fruited, making the cut just beyond the second bud from the base. As passion vines often are bearing the remains of a winter crop at the time this pruning is required, there is a temptation to delay action until after harvesting that crop. By that time—November—the new growth for the summer crop is generally well advanced, vines being covered with flowers and young fruits. However, if it is necessary to delay pruning in order to harvest the later fruits of the winter crop, it is important that pruning be continued during November and December, even if it means cutting off some of the prospective summer crop. Keep the vine as open as possible, and, with the exception of the original leaders, constantly prune off the worn-out laterals to a bud at the base.

All prunings should be taken out of the vineyard and burnt and the ashes returned as a manure to the vines. Little pruning should be done in the autumn on account of the tendency of the vines to die back in winter if pruned late in the season. It is difficult to prune so that a summer or winter crop only results but early spring pruning should produce a summer crop and later pruning a winter crop.

—A. M. W. GREIG, Citriculturist, Auckland.

(To be continued.)

Cool Storage Notes

Cool Storage of Fruit

THE present emergency conditions make the question of cool storage of fruit a pressing one, as sufficient storage space is necessary to ensure adequate supplies being held to provide for the requirements of the markets of the Dominion throughout the season.

The object of placing fruit in cool storage is to retard, as far as possible, the physiological processes which cause its ripening and ultimate decay. Success with storage largely depends on the condition of the fruit when placed in storage. No greater mistake can be made than by placing **any** kind of fruit in storage, and not recognising that to be successful special treatment is required from the time the fruit is harvested until it is put into the stores.

Refrigeration can check only to a limited degree, decay in fruit that is already past its prime; but it will sufficiently retard the ripening process of mature fruit of good quality to enable it to be kept for a considerable time.

Fruit for long storage must be of the best quality, it must be picked at the right time, be free from blemishes and disease, and packed and handled with special care. Allowance should be made for the time which will be occupied in transit, as fruit should be timed to arrive at the store in the best possible condition. The greatest of care should be exercised in avoiding delays that may occur between harvesting and storage.

Size is another factor that has an important bearing upon the keeping quality of fruit. Over-grown specimens always deteriorate more quickly than average ones. To get the best results a good medium size for the particular variety should be chosen for long storage.

To obtain a more reliable average result with Jonathan apples from year to year for short storage, only medium sizes should be held, and the flesh temperature should not be reduced under 38 deg. F. Granny Smith apples grown under New Zealand conditions should be delayed before storage and wrapped in oil wraps, if they are to be held successfully from year to year after mid-August.

By attention to the above recommendations, and by carefully stacking the fruit in the storage chambers, and stacking to growers' registered numbers wherever this is possible, strict attention to the temperature and relative humidity conditions during storage, and also by carrying out a careful examination of the stored fruit at regular intervals, the storage results throughout the season should be satisfactory.

—A. A. POWELL, Cool Storage Officer, Wellington.

Guide for the Home Garden

The Garden — A Vegetable Factory

VEGETABLES, as essential human food, call for more than casual consideration when their production is contemplated. So many factors have to be taken into account that hasty decisions may easily lead to undesirable and disappointing results.

The first, and perhaps the most important factor is the soil, its nature, and physical structure. Also of importance is its degree of fertility, which has a direct relationship to its humus and calcium content, and generally what may be termed its available plant food.

"Crop Mining"

Under conditions of economic stress "crop mining" may sometimes be resorted to. Literally, this term—"crop mining"—means taking as much as possible out of the soil without returning the plant foods removed by the crops during their period of growth and development. This cultural practice cannot be too strongly condemned. So far as is practicable, when intensive crop production is carried on, replacement of the plant nutrients in the soil should be attended to as early as possible after the crop has been harvested. Vegetables of high quality cannot be produced on impoverished land, nor is it likely that the desired quantity can be maintained. Soil used for continuous vegetable production should be maintained at a high fertility level, and where no stable or farmyard manure is available the practice of growing green crops for subsequent digging-in is recommended.

For the production of the necessary quantity of high quality produce, the garden might be looked upon as a vegetable factory. If this view is taken—and the simile is an appropriate one—the value of the produce will be in relation to the degree of efficiency maintained.

Climate

Next to the soil, climatic conditions must be considered. All varieties of vegetables cannot be successfully produced under similar conditions. Spring and savoy cabbages, for best production, require cool temperatures, while relatively warm conditions are desirable for summer varieties. Lettuce, which by the adoption of proper cultural practices may be grown quite satisfactorily during summer, is essentially a cool weather vegetable. Spinach, during warm weather, has a distinct tendency to "bolt" to seed. Tomatoes, peppers, and cucumbers are risky crops in any locality where cold temperatures generally prevail.

Cost of Production

So far as the production of vegetables in the home garden is concerned, this expression—cost of production—may be quite easily misunderstood. When purchases are made from a vendor, it should not be overlooked that all costs which may occur after the produce leaves the grower, are generally paid by the consumer. When vegetables are produced in one's own garden, the main costs are for seeds, manure, and for plant protection specifics. As against these costs there is the added privilege of obtaining supplies of fresh vegetables whenever they are desired, and it is recognised that vegetables fresh from the garden are then at the peak of their nutritional value.

Area of Garden

The area of land necessary to supply a given number of people with sufficient vegetables to meet ordinary domestic demands is a much disputed point. It has, however, been reliably estimated that ¼-acre properly cultivated would be sufficient to provide adequate supplies for six persons. In any discussion on the size of a garden it should be remembered that a well-kept small area is better than a neglected large area.

Profitable Vegetables

While there are certain varieties of vegetables which may be looked upon as a basic necessity for consumption, the home gardener will be guided in his production programme mainly by family requirements. Generally, however, and particularly where the area of land is not extensive, the choice of vegetables to grow should be restricted to those which will be most beneficial to the persons who may consume them. On small gardens, annual crops which may require six months, and even longer to reach maturity, and then are quickly cut out, may not be as profitable to grow as quick-maturing crops. Again, crops which may occupy a given area for the above-mentioned time, and when harvested remain in consumable condition for some months longer, will be profitable to produce.

The month of March will see most of the garden vegetable crops well on the way to maturity.

Cauliflowers

These will be in their final stages of growth before harvesting. Provided self-protecting varieties have been grown, the curds will not be so readily exposed to direct sunlight. Exposure to light results in discoloration, quickly followed by loosening and opening up of the heads, thus making them unfit for table use, but still capable of being used for pickling. It is recommended that this crop be completely removed before frosts begin. Subject to frosts, cauliflowers rapidly deteriorate and are quickly spoiled. Maturing cauliflower curds when not immediately required for use may be protected by tying the long outside leaves loosely together. This may be done with strands of flax or string. A rubber band cut from an old motor tube and slipped over the tips of the leaves may be used. A quicker method, but not quite so effective, is to crack the main rib of the larger outside leaves and bend them over the curd.

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What to Do in the Home Garden Next Month

Summary of Operations During March

SUCCESSIONAL SOWINGS.

Peas (dwarf), lettuce, radish.

OTHER SOWINGS.

Carrots (Scarlet Horn, Earlykrop), onions (Pukekohe Longkeeper), swedes (Success, Superlative), spinach Prickly), endive, beetroot.

CROPS IN SEASON.

(The month in brackets represents the month of sowing). Lettuce (June, to harvest late Oct.-Nov.), cucumbers (Sept., Oct.), celery (Sept.), egg plant (Oct.), spring onions (Mar.), marrows (in pots under glass, later transplanted in the open, late Aug.), pumpkins (outside Sept., Oct.). beans (Sept., Oct., Nov., according to district). Potatoes.—When digging main crop, select seed and store separately, later to be placed in seedling boxes.

Broccoli

This vegetable is generally much hardier than cauliflower, and from the colour of the curd of modern varieties is difficult to distinguish from the latter vegetable. Liquid manure applied after liberal watering will assist the plants to maintain their vigorous growth. The aim should be to maintain the foliage in a dark green condition. Leaves kept in this colour indicate healthy and vigorous growth.

Winter Cabbage

Early plantings should now be making hearts, but at this stage close attention to the probable depredations of caterpillars is necessary. Whether using nicotine sulphate, arsenate of lead or derris, the hearts should be particularly attended to. Once these pests gain access to the heart of the plant, destruction of this edible part is assured. Liquid manurial treatment, as advised for broccoli, will be suitable for winter cabbages.

Tomatoes

The importance of the greatest possible attention being paid to tomato plants which should now be bearing ripe fruit is again stressed. Too much reliance should not be placed on obtaining adequate requirements from markets at glut season prices. Conditions obtaining in the Dominion at present will not justify this expectation, consequently it becomes more than ever necessary to endeavour to prolong the producing season. This can best be accomplished by closely observing the condition of the plants during fruit bearing and harvesting.

As soon as the second truss is ripening, and the tomatoes remaining on the vines do not indicate signs of developing into ordinary size fruits, more fertiliser should be applied, watered in and the soil round the plants hoed at a shallow depth. Liquid manuring every week—after watering—will materially assist the plants to maintain growth, and produce their greatest yield of fruit. Remove the surplus shoots as soon as they appear, as these grow at the expense of the development of the main plant. Pick all tomatoes whenever colouring begins. This will conserve the vigour of the plants and prevent destruction of the fruits by birds.

Kumeras

As soon as the vines begin to spread they will tend to root at the nodes. This rooting should be prevented, and is best done by occasionally lifting the vines clear of the ground. Where rooting has already taken place, no attempt should be made to tug the roots clear of the soil. These should be cut with a sharp knife. Leaf destruction by grubs is sometimes met with in this crop; but the application of a spray consisting of 1½ oz. of arsenate of lead powder to 5 gals. of water will usually be effective as a destroying agent.

Sweet Corn

Cobs of these plants should be pulled and cooked when young and tender. This condition is known as the milk stage of development. With the possible exception of asparagus, no crop, after harvesting, deteriorates faster than sweet corn. The best indication that the crop is ready for harvesting is when the "tassel"—the tip of the husk—becomes withered..

Onions

When the foliage has completely died down the bulb may be lifted and left to dry on the ground for two or three days If wet or damp conditions obtain at harvest time, it would be advisable to remove the crop to a wooden bench or verandah where the onions will be exposed to the drying action of the sun and wind. Under these conditions the bulbs will ripen properly, and with the roots removed and the tops remaining they can be "strung" by twisting the tops around a piece of wire or heavy binder twine and hung in a shed through which a good current of fresh air passes constantly.

Spring Cabbage

During the latter part of February or early March—earlier in Canterbury and further south—seed of cabbages for use in early spring may be sown. A seedling box can be used, but should not be less than six inches deep, this depth being necessary to permit full development of the rooting system. The soil should be a good compost mixture — preferably sterilised — with which has been incorporated a handful of bonedust. The seed can be sown in shallow drills, and covered with soil of a similar composition to that used for propagation.

When the sowing operation has been completed the surface soil should be pressed gently, but firmly, with a short piece of dressed timber. The box can then be covered with a double sheet of paper—newspaper will be appropriate —and placed in a shady position. Should the top soil tend to become dry —a condition which will inhibit good germination—water by soaking the box in a tub of water. If this is not practicable, cover the soil with a piece of sacking, and water with a "rose" attached to a watering can. This method will prevent the seed being washed to the surface of the soil where germination is likely to be seriously impaired, if not entirely prevented. The paper should be replaced after watering, but must be removed immediately germination begins.

Almost from the time the young plants appear, they will require to be protected from aphis and caterpillar attacks. Dusting or spraying with nicotine sulphate, arsenate of lead or derris will afford adequate protection. The variety recommended is Flower of Spring.

—D. K. PRITCHARD, Instructor in Vegetable Culture, Wellington.

Careless Handling of Pigs

Concern is felt in many quarters at the prevalence of bruises and weals on various parts of the skin of pigs. Farmers, dealers and carriers should do their utmost to avoid causing skin blemishes, which may bring about the degrading of otherwise prime porker or baconer carcasses. Much can be done by a little more care and patience, the use of a proper yard and loading race, and the absolute prohibition of rough handling, stock whips and sticks.

All engaged in the handling of pigs should obtain a copy of the Department's free bulletin (No. 175) on this subject.

Seasonal Work for Beekeepers

Harvesting

MANY methods are used to remove surplus stores of honey from the hives, including brushing the bees off the combs, the use of any odorous disinfectant (carbolic), and bee escape boards. A bee brush in the hands of a competent beekeeper may be used occasionally to advantage; but, generally speaking, this method is not good, especially where there are combs of honey not fully capped over, or where there are broken burr or brace combs. In either case the brush soon becomes clogged and hard with liquid honey. In these circumstances many bees are injured or killed, and the rest of the colony soon becomes irritated and aggressive. The work is slow and laborious, and in the autumn robbing conditions will quickly develop, making it impossible for the beekeeper to continue without serious consequences.

While the use of strong disinfectants, applied on the top of the hive with the aid of a specially-constructed cloth and metal cover, is the quickest way to drive bees down and out of the supers, this method, in the light of considerable experience of recent years, cannot be recommended for the safe removal of honey at harvesting time. No matter how careful the beekeeper may be, the honey is contaminated little or much according to the method of application, and where carbolic taint is not noticeable as such the natural delicate flavour and aroma of the honey is destroyed.

Bee Escape Boards

The most effective and safe method so far used by modern beekeepers to remove the surplus crop of honey is by means of a Porter bee escape fitted into a flat board, cleated on one side to provide a bee space as illustrated, and made to the top dimensions of the hive in use. The bee escape is a small metal trap or spring through which the bees can pass one way only, and once they leave the super by this means they cannot return.

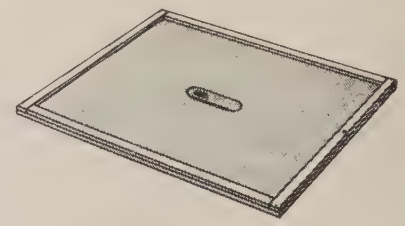
To place the board in position loosen the top super of honey with a hive tool at the back end to break any propolis connections, tilt the super up with one hand so that it rests on its front edge, and slide in the escape board as far as it will go, then let the super rest down gently on it and straighten both the board and super into alignment with the hive. With practice the operation can be completed in a few seconds without undue disturbance of the bees.

Porter Bee-Escape.

Where bees are shut off from the colony below in this manner they will not rest until they find an exit, which they eventually do by passing down through the flexible outlet in the escape board. Should there be brood in the super, however, the bees will not leave. The usual practice is to place the escape boards on the hives late in the day and remove the honey supers early the following morning when they are usually free of all bees.

Double outlet escapes are an improvement, as they guard against the possibility of a blockage either by an injured bee or by pieces of projecting burr comb. It is also an improvement to place two escapes in each board, one on each side slightly away from centre.

Hodson Ventilated Board. The Hodson ventilated escape board is a wooden frame covered with wire cloth, which allows the warmth of the colony to rise into the super, and was designed to keep the honey warm above the escape board for easy extraction from the combs. Where used well above the brood nest this appliance is effective; but when placed under the third



Bee Escape Board.

super or close to the main colony cluster, many of the bees above the escape board seem content to remain there, where it is warm and where they also have contact, through the wire mesh, with the colony below.

—T. S. WINTER, Senior Apiary Instructor, Wellington.

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Notes for the Poultry Farmer

Culling and Selection of Breeding Stock

— By —

H. A. KITTO,
Poultry Instructor, Palmerston North.

DURING the next few weeks it should be the aim of every poultry-keeper to concentrate on the culling of the weaker specimens in his flock. At the same time the selection of next season's breeding hens is essential. With the approach of the late summer and early autumn months the moulting period sets in, and it has been recognised by good authorities that during the months of February and March, or just before the moulting process begins, is the best time to carry out this important work. Practical poultry-keepers fully realise that certain signs manifest themselves at this season of the year, indicating whether a bird has been a heavy producer and is likely to be worth keeping for another laying season.

There are many different breeds of poultry, and although these may differ a good deal in shape and characteristics, birds possessing egg-production capacity, combined with constitutional vigour, have the same outstanding points when kept under normal conditions.

Culling

In commercial flocks the culling of the weaker and non-productive specimens should be practised throughout the year. The main culling of adult stock should take place during the months of March and February. At this season of the year every bird should be handled and examined for defects, and birds that do not pass the test as being suitable to keep for another season's laying should be removed and sold. Before starting to cull a pen of birds, the operator should know something of the conditions under which the birds have been kept, and also their age. For instance, if the flock has been subjected to a sudden change in diet, especially during December or January, many good birds may have been forced into a moult. The same thing is likely to happen if the flock has been under-fed. In fact, when a large percentage of a flock ceases laying, and goes into a moult before the New Year, it is usually an indication of under-feeding.

The age of the birds must be considered. This is important. Yearling hens or pullets which started to lay in February or March of last year could hardly be expected to lay as late into the autumn as the second-year hens, which were the pick of the flock, and which did not come back into production until July or August. It is a good plan to separate the birds of different ages. Where this is not practicable, birds should be marked by the use of a ring on the leg.

In culling a flock of birds, the following is recommended:—

1. All birds that are two and a half years old, or over, should be disposed of as soon as they have stopped laying. After two laying seasons hens are usually finished as profitable commercial egg-producers. Should a poultry-keeper find that he cannot select the desired number of breeding birds from the younger stock, it is advisable to retain a number of the two and a half year old hens of exceptional breed type for another breeding season. This is preferable to breeding from pullets which have not proved their constitutional vigour and their ability as layers.

2. The first birds of a given age to moult should be culled, as such birds are of poor constitution, the last birds to moult in a flock being generally the strongest and best producers. Usually birds which moult between December and the end of February are not profitable, and these should be culled and disposed of without hesitation.

3. Any over-fat or exceptionally heavy hens of the breed they represent should be culled. The fact of their becoming over-fat would indicate their inability to produce, and they are seldom good producers.

4. Birds showing want of vigour and vitality should be culled. These can be picked out by their sluggish appearance, looseness of feather and pale faces, with dullness of the head and eye. The comb will have a drying tendency and a stiffening appearance. Slow-moving, sluggish birds are never great producers. Physical activity is an evidence of health, and those birds that are constantly on the hunt for food and which never appear satisfied are usually the best. The heavy eaters are the best layers—increased food production means increased egg-production, and failing appetites mean a lower egg-yield. It therefore follows that the heavy producers have a good crop capacity, and as they are digesting a large quantity of food they usually possess a good depth of abdomen. The deepest part of a bird's body is at the stump of the tail.

Good Layers

Good laying specimens will be found with all their old feathers on. The plumage lies tightly to the body, and is generally faded and shabby, being often dirty and dry in appearance. The face and comb will be bright red in colour, and frequently the smaller feathers of the head and upper part of the neck are completely worn off, showing practically the same bright red colour as the comb and face. The boldness and brightness of the eye are outstanding. These characteristics are particularly good points, indicating strong constitution and vigour.

In most cases the tail feathers are worn short, indicating many visits to the nest-box during the year. Each time a visit is made to the nest the hen turns round to make herself comfortable and the tail comes in contact with the sides of the nest, thus causing it to become worn and quill-bare. The legs

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and beak at this season of the year are pale and bleached in colour, and the rich yellow colour noticed in many breeds when in full new feather will have completely disappeared.

In the black-feathered birds the indication in feathering most desired in the heavy laying hen at this period of the year is the fading of the feathers to a rusty brown colour, while the other outstanding qualities mentioned of the comb, face, head, eyes, etc., are exactly the same. This applies to all breeds which possess high egg-laying capacity.

Breeding Stock

In the selection of breeding hens, only birds of good breed type and fair specimens as far as shape and size are concerned, should be used. Good width of the back over the egg cluster and a well-developed, deep abdomen are most desirable, to give room in the bird's body for the full development of the ovaries and oviduct, the egg-producing organs. The legs should be short in the shank and well set apart, to assist the bird to support the full, deep abdomen, and to give perfect balance. The bone of the legs should be flat, and the bone in the side of the leg of a similar nature to the bones throughout the body, further indicating strength and constitutional qualities. The beak should be strong and slightly curved in shape, and the bird active and alert. The comb should be smooth, soft and silky to the touch, although not too large. This smoothness of the comb indicates the quality and texture which will be similar in the skin throughout the body.

The points mentioned regarding high production capacity should be present in the make-up of a desirable breeding pen.

Answer to Correspondent

Feeding Ducks

"INQUIRER" (RIVERHEAD):—

I am an inexperienced poultry keeper with a small flock of ducks, and am feeding them on the No. 2 mash advocated in the "Journal." I find the cost rather high. I would be obliged if through your columns you could give some indication of the amount of food (No. 2 mash) required by 100 ducks per day running on an acre of land.

SUPERINTENDENT OF POULTRY HUSBANDRY:—

It is customary to feed laying ducks with grain and mash, and the total amount of the two should vary according to the egg production of the ducks in question. When starting to lay, about 4 oz. total is sufficient per bird, but when production reaches its peak in spring, the ducks will often eat 5 to 5½ oz. per bird. Hence, assuming that your ducks receive half grain and half mash per day as is the usual method of feeding, 100 ducks will require:

(a) At present—approximately 12 lb. mash daily.

(b) In the spring—approximately 18 to 20 lb. of mash daily.

You must use your own judgment at the time of feeding as to whether the birds are receiving sufficient mash or whether you appear to be over-feeding at any time. No hard and fast rules can be laid down for feeding amounts, but the figures given above will assist you as a guide to the correct amount to feed. I have allowed 3 oz. per bird for mash in the spring, and this would be augmented with 2 oz. per bird of grain.

Coccidiosis of Poultry

Coccidiosis is one of the most destructive diseases of poultry, and is probably the most prevalent infectious disease attacking poultry in New Zealand. This disease has been reported from many districts in both islands and the annual loss among infected birds is heavy.

It is, therefore, of considerable importance that poultry keepers should be able to recognise an outbreak of coccidiosis and to know what steps to take to bring such an outbreak under control.

Every poultrykeeper should write to the Department of Agriculture for a free copy of Bulletin No. 22, "Coccidiosis of Poultry."

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Appeal to Y.F.C. Members

By S. FREEMAN, Dominion Organising Secretary.

IT is hardly necessary to remind members that our movement, in common with other organisations, is undergoing a severe trial and passing through a very critical period. So far as that trial is concerned the movement has, in my opinion, stood up to the test. This speaks volumes for the worth of the movement itself, and for the enthusiasm and keenness of those who have striven manfully, and so far successfully, to carry on.

The handicaps and difficulties with which the organisation has had to contend during the past three years have been sufficient to put out of existence any movement the foundations of which had been "built on sand." In naming some of these handicaps I am not making excuses—I am merely stating facts. Depletion of membership, transport restrictions, difficulty in obtaining lecturers—all these have been severe blows—but not so severe as the apathy that has been displayed (inevitably, perhaps) by some sections of the movement.

In many clubs it has been left to a small band of enthusiasts to carry on, but they have made good. Certainly we would be glad to see more clubs functioning and more members taking an active part in club and organisation affairs, but it should be realised that well over 3000 of our members are on active service, either at home or abroad, and that a considerable number of others are tied down to essential work, with little or no leisure. Taking everything into consideration I feel that we have a right to congratulate ourselves on the fact that out of the 212 active clubs prior to the war, we today still have 70 clubs able to function. I am also sufficiently an optimist to believe that, so far as our serious difficulties in the Y.F.C. movement are concerned, we have passed the crisis and have every prospect of making perhaps slow, but nevertheless sure and steady progress.

Members Overseas

Only those associated with the movement can be aware of the keen interest taken in the organisation and its activities by its members overseas; letters from members on active service bear this out, often displaying a solicitude for the well-being of the movement that in itself is an indication of the desire that their organisation should be carried on.

The formation of a Young Farmers' club among the troops in Egypt, and the more recent establishment of a club in a prisoner of war camp in Italy —these go to show that even though those of our members are far removed in person from their individual clubs at home, they are very near in spirit. This should inspire us to greater effort in our endeavour to keep the movement alive for our comrades when they return. Some of them, alas, have made the supreme sacrifice—to their relatives we extend our sincere and deepest sympathy. To the others, when they return, we shall be called upon to render an account of our stewardship; this should urge us to greater endeavour. A number have already returned and are encouraged by the fact that our organisation is still carrying on.

War Effort

So far as the war effort itself is concerned the Y.F.C. movement has contributed its share, and is still contributing—possible more than would at first sight appear. The efforts of members, right from the outbreak of war, have been directed towards the assistance of the many appeals that have been instituted, both from the patriotic and the primary production standpoint —and their efforts have not been in vain. Probably no other organisation has suffered to the same extent directly so far as the depletion of man-power is concerned—and those who have remained behind are fighting on "the home-front" to keep the "flag flying," and the land productive so as to supply the needs of their comrades overseas, and of our allies at present in New Zealand—and still our movement carries on!

What a splendid answer to those who, less than a year ago advocated the closing down of the whole movement! Their idea was, doubtless, sound so far as it went. It was argued that there would be a far better chance of re-starting the movement "from scratch" if it were closed down gracefully, rather than let it die a lingering death, and allow interest to wane to such an extent that it would be next to impossible to revive it after the war.

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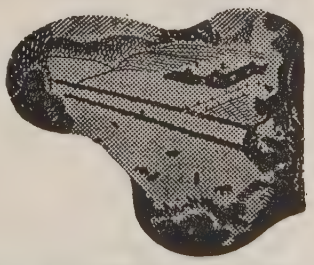

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J.A.

But why allow interest to die out? Why let the organisation fade away when there was a very definite chance of saving it?

Fortunately, among those closely associated with the movement there were sufficient with unbounded faith in the organisation and its capabilities. It was realised that if the movement went into recess many who are today interested might conceivably lose their keenness, and a younger generation would grow up to whom the Y.F.C. organisation and its activities and usefulness would be a closed book.

Clubs Carry On

There are still a number of strong clubs throughout the Dominion—clubs that are willing and able to carry on successfully, and to deprive them of their organisation would be tantamount to giving them a "stab in the back." These clubs are active today by virtue of the fact that they have been able to recruit the younger members. Doubtless they would still function as clubs if the Federation went right out of existence, but they would be faced with the disadvantage of being no longer part of a national organisation, and might easily develop along lines divergent from the present Y.F.C. aims and objects. There are also a number of clubs that can carry on provided that they receive just that little amount of encouragement and stimulus that only the organisation can give. At the expense of being trite I would remind members that "where there's a will there's a way!"

The war has placed heavy responsibilities on all sections of the community. We must meet the immediate situation, but we must also see to it that we are not blind to the needs of the future. The Young Farmers' club movement has demonstrated its worth in the past, and there can be no doubt that it has a great potential value, especially as regards post-war reconstruction. On this account all who are interested in the organisation should make an effort to preserve, even in these difficult times, at least the framework of the movement, so that there will be something tangible upon which to rebuild after the war. The foundations are solid; the proof of this lies in the progress that was made in barely five years prior to the outbreak of war —a progress that could be measured not merely by the number of clubs formed or the total membership, but by the type and extent of the activities being undertaken and carried out. That the value of its aims, objects, and ideals was recognised is evident by the interest taken in the movement by the older farmers and the kindred organisations, and the encouragement received at their hands.

Younger Members

We are faced today with the knowledge that we **must** and **can** carry on, but that to do this we must first of all "put our house in order." It must be admitted that, prior to the war period, very little effort had been made so far as most units of our organisation were concerned, in the direction of enrolling the younger members. We were content for them to join up, often to see them, through lack of interest on their part, and lack of foresight on the part of the older members, drift away again. Today we not only realise that we are dependent upon them and their support for the continuation and well-being of our movement, but we are confident that by neglecting to cater for the younger members of the farming community we are not only doing them an injustice and depriving them of what is, after all, their right, but we are doing our organisation an irreparable injury.

A campaign is being launched with the idea of interesting particularly the lads leaving school, and also endeavouring to form clubs in high schools such as have already been successfully established in one or two centres. With the interest and encouragement of the Education authorities and those directly associated with the schools, together with the active assistance of all units of our organisation, we feel that we shall meet with success.

Challenge

SERPENTINE SUPER

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"Leadership"

Of necessity the present activities of the movement are curtailed. Activities in the past have been many and various, and have assisted members along the right lines so far as the practical side of farming is concerned; they have also developed among the youth of the farming community a deeper sense of responsibility and a greater interest in their own heritage, the soil. Open discussion and debate have, perhaps, been the most valuable of our activities—and despite of difficulties, there is every reason why they should be continued.

There is much talk of "leadership" in the world today; our own organisation is about to start a "leadership" campaign. We need leaders in the Young Farmers' clubs. The farming community needs its leaders—the nation needs its leaders. What does "leadership" imply? Self-reliance, confidence, dependability, courage and resource—all these are essential to leadership. Some are born leaders—but the capacity to judge right from wrong and the ability to clothe thoughts and ideas in words—these attributes can be cultivated and fostered in us all—and with the will to undertake responsibility, so can the qualities of "leadership" be evolved.

You can help your club in many ways—and thereby help the Y.F.C. movement. Difficulties in the way of securing good attendances may appear many—but don't be discouraged if you strike a poorly-attended meeting. Do your best to secure a better attendance at the next one! Remember, if **you** stay away from a meeting you are discouraging the other fellow! Some clubs are facing up to the transport problem by holding meetings every two months—while not to be encouraged unless necessary, this is definitely an alternative to be preferred to going into recess. Field days should be encouraged, and where distances do not unduly interfere, inter-club visits should be exchanged wherever possible.

Take advantage of every opportunity for publicity; use the local Press to advertise and report upon your meetings. Incidentally club secretaries should **send in regular reports of meetings and other activities** in order that they may be published in this section of the "Journal of Agriculture." Do your best to enrol the younger members—make your meetings interesting enough to secure them as members, and sufficiently attractive to hold them.

"Unattached" Members

To district committees I would appeal to do their best to keep the existing clubs alive, and to seize the first opportunity to revive those that have temporarily closed down. To the erstwhile members of clubs that have gone into recess I would add a few words: Try to retain interest in your organisation, even though, through no fault of your own, your club is unable to function. Get in touch with your district secretary and become what we are terming an "unattached" member; this will preserve your rights and privileges as a member, and will enable you to receive the "Journal of Agriculture," which publication still remains the official organ of your organisation, and contains this special Y.F.C. section. You will be able to participate in any district activity that may be undertaken, and by your example you will be able to help others to throw their weight into the scale, and so collectively "do your bit" towards keeping this valuable movement alive.

Annual Meetings

I would remind club chairmen and secretaries that their annual meetings should be held, as far as possible, before the end of March; district annual meetings should be held by the end of April. I shall be glad to receive full reports of all annual meetings, giving names of officers elected, etc.; and also, as soon as possible, complete rolls of membership for "Journal" distribution purposes. I would also remind club secretaries that the Y.F.C. Roll of Honour is still published every three months, and that if they wish to make any alterations or additions they should do so at an early date.

Auckland Y.F.C. Council Meeting

THE attendance at the recent Auckland council meeting, held at Hamilton, included the following:—Messrs. A. F. Walter (vice-chairman), D. S. Ross (Dominion President), J. M. Smith (Fields Superintendent, Department of Agriculture, Auckland), W. G. Neill, R. T. White, C. G. Murphy, D. Brightwell, W. Hudson, J. R. Murray, J. F. Shepherd and E. B. Glanville (hon. secretary). Mr. S. Freeman (Dominion Organising Secretary) was present by invitation.

Apologies were received from Messrs. D. E. Waide (chairman), C. S. Dalgleish, K. M. Montgomery, G. Spratt, N. Murray, T. F. McDowell, B. Gordon, Lloyd, and W. A. McCracken. In the absence of the chairman, the vice-chairman, Mr. A. F. Walter, presided over the meeting.

Arising out of the minutes of the previous meeting discussion took place and the following decisions were arrived at: Depreciation on the council's cups and trophies to be fixed at 2½ per cent.; the council photographic competition to be reviewed at the annual meeting in May; district committees to be made responsible for the radio talks to be broadcast in the Y.F.C. session at 1YA during 1943, the finalising of the respective dates to be left to the council secretary; the organising secretary to be notified of the dates and subjects of the broadcasts, for inclusion in the Y.F.C. section of the "Journal of Agriculture." Delegates from the Eastern and Western Bay of Plenty committees reported on the debating activities within their areas and advised that the Te Puke Club had won the cup donated by the council to the Eastern Area for the council's debating contest.

Club Strength

Reports were received from delegates indicating the strength and activities of clubs in the various districts, and the position of the clubs within the Auckland council area was shown to be as follows:—

N. Auckland, 1 active club.
Auckland, 1 active club.
Waikato, 1 active club.
King Country, I active club.
E. Bay of Plenty, 2 active clubs.
W. Bay of Plenty, 5 active clubs and 4 partly active.

Prior to the war there were 54 active clubs in the Auckland area: 38 of them had gone into recess for the duration of the war. It was considered that the remaining sixteen were in a position to carry on.

Mr. D. S. Ross, Dominion President, in addressing the meeting, appealed to delegates to continue to hold regular meetings wherever possible; it was particularly noticeable that where regular meetings were held the clubs, and the activities generally, were in a relatively stronger position. He definitely urged the recruiting of younger

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members, such as lads leaving high school, and also advocated the forming of clubs in the high schools themselves, wherever possible. He stressed the value of lectures, field days and debating and the necessity for the encouraging of such activities. The movement had so far come through difficult times; members, however, must not rest content—every effort should be made to put the organisation on an even better footing.

The organising secretary, Mr. S. Freeman, gave the following figures relative to the position of the clubs throughout the Dominion:

	Clubs functioning.	At commencement of war period.
Auckland Council area	16	54
Wellington Council area	20	81
Canterbury Council area	21	41
Otago-Southland Council area	13	36

A total of 70 clubs now active out of 212 functioning prior to the war. He considered the position, with due regard to difficulties and handicaps, to be a satisfactory one; the movement was still very much alive and he had faith in its future. He reminded members that the active clubs were at present functioning mainly by virtue of the fact that they had recruited the younger members. He endorsed Mr. Ross' remarks and entirely agreed that the holding of regular meetings by units of the organisation materially strengthened the movement.

Remits

Remits were carried as follows: That in Junior stock-judging competitions a system of **giving points** together with reasons be permitted within the clubs when district committees desire it; That instead of showing competitor's names on the stock-judging cards each competitor be given a number, so that judges will be unaware of competitor's identity. In this connection it was pointed out that provision is already made for numbering judging cards, but the remit was allowed to remain, the council giving a ruling that the numbering should be enforced; That the matter of the Y.F.C. memorial scheme be brought up for further discussion at the annual meeting of the council. In connection with funds of clubs in recess held in trust by district committees, and their suggested use for the purpose of keeping the movement alive, a ruling was given that such funds must not be used by district committees for any purpose, but must be held and handed back to individual clubs when they are resuscitated.

Other motions passed included the following: That the matter of obtaining oil fuel licences for delegates to attend council meetings be brought to the notice of the Dominion Executive committee for action in such cases where reasonable transport facilities are not available; That the question of a "drive" to stimulate interest in the club movement be brought up at the next meeting.

Mr. Murphy stated that an Oratory Competition was to be conducted among King Country members during the coming year, with the idea of getting junior members on their feet; an endeavour would be made to set a reasonably high standard for debating, and it was considered that this method of encouraging the junior members to speak would assist to bring about the desired result.

Publicity

The question of publicity was discussed, the general opinion being that more use could be made of the Press; it was further pointed out that club secretaries should forward regular reports of monthly meetings, etc., for inclusion in the Y.F.C. section of the "Journal of Agriculture." The matter of lantern slides and lectures by Departmental officers was mentioned, and Mr. Smith stated that the instructors generally throughout the province were heavily taxed with increased duties and longer hours, but even so he was sure that they would give assistance wherever possible.

The organising secretary advised the meeting that arrangements had been made for delegates attending council and Dominion executive committee meetings to be granted travel permits by the Railway Department.

The date of the next meeting of the council was fixed for February 24, the meeting to be held at Tauranga. The meeting closed with a vote of thanks to the chair.

Report on Club Activities

SOUTH CANTERBURY.

Hinds.—Address by Mr. W. Taylor on his tour of Canada in 1938. There were 11 members present out of a membership of 16.

Methven.—Discussion in connection with the holding of a district stock-judging competition to be held at Ashburton; club members agreed to support this. Decided to hold a club field day on Mr. R. J. Low's property. Club social to be held; social committee elected. A general discussion took place on matters pertaining to club affairs. At the previous meeting the secretary undertook, with the assistance of club members, to compile a "brands and earmarks" book of all sheep owners in the district. An address was given by Dr. Weston, of Lincoln College, on "Farm Bookkeeping and General Economics."

CHRISTCHURCH.

Ellesmere.—General business. Date of club annual meeting decided upon. Address by Mr. R. W. Morgan, of the International Harvester Co. on "Some Aspects of the American War Effort." The speaker also exhibited some very interesting sound films. Attendance of 23 members.

NELSON.

Murchison.—Business meeting. Date fixed for annual meeting. Arrangements for dog trial. Two members enrolled.

MANAWATU.

Bunnythorpe.—General business and finance. Discussion on potato-growing competition; arrangements made for first field day, when seven of the twelve crops will be visited. Brian Fowler, a club member, spoke on "Spain and Hungary." Eleven members present out of fourteen.

SOUTHERN HAWKE'S BAY.

Dannevirke.—General business. Short talk by G. Franklin, a club member, on "Subterranean Clover and Topdressing Hill Country." Address by Major Holmes on "Egypt and Palestine in the Last War." Attendance of thirteen.

EASTERN BAY OF PLENTY.

Whakatane.—Lantern lecture by Mr. J. R. Murray, Department of Agriculture, on "The Breaking in of Pumice Land." Seventeen members present out of a total of nineteen.

WARKWORTH.

Kaukapakapa.—Report on recent club dance. Christmas card received from former club president now serving overseas. Two new members enrolled. A debate was held with the pupils of Kaukapakapa School, the subject being "That Dairy Farming is Better Than Sheep-farming." The school team, which took the affirmative, won the debate. Speakers: School, J. Jordan (leader), J. Weaver, A. Henley; Club, F. Swinburne (leader), F. Henley, and R. Seaman. There was an attendance of 16 club members.

Health Notes for the Farm

Have You a Personal Problem?

Contributed by the
DEPARTMENT OF HEALTH

EVERY one of us has a private ambition to get all we can out of life; in other words, to live to a ripe old age. But the trouble is that too many of us don't bother to make any effort to earn or deserve that happy state of affairs. We are too easily content to accept it as a matter of course.

But if you want to be guaranteed a happy, healthy future you've got to do something about it yourself. No one else can do it for you. It's a personal problem, and you stand or fall by your own individual effort.

A major public health problem of today is to get the individual man and woman intelligently interested in conserving his or her health, in adopting a scheme of living that will guard against any untimely breakdown of the vital organs. One of the most common causes of death today is the degenerative disease, and health authorities all over the world are deeply concerned at the toll it is taking of human life.

A Heavy Price

Communicable diseases can be brought under control, but heart and kidney diseases, high blood pressure, hardening of the arteries, and other conditions due to the breakdown of the organs of the body, are exacting a very heavy price. It is up to you to determine exactly what your personal problem is, and then set about correcting it.

Maybe it is overwork. Overwork and working continuously under pressure are hazardous to health and long life—in fact, they undermine even the sturdiest constitution with the deadliness of disease. Try taking properly-planned holidays, or better still, get into the habit of having a regular period of rest and relaxation each day. There's no work so important that it can't wait for a few minutes. One of the best tonics in the world for the hard-working man, whether farmer or business man, is a half-hour of complete relaxation every afternoon, and as often as possible besides. Just take the load off your heart and your nervous system for a while.

Too Much to Eat

Again, your personal problem may be one of over-eating or eating unwisely. Over-eating is a widespread fault—almost an evil. Its effects are certainly evil. Lack of interest in the proper selection and combination of foods, together with faulty eating habits, are the cause of most stomach ailments, and much personal ill-health.

There's no reason today why everyone should not be well-informed as to the basic elements and values of food, and be able to apply this knowledge to everyday living. The Department of Health has paid special attention to the question of diet in its booklet "Good Nutrition," which can be purchased anywhere.

It is relevant to mention that the specified hazards of overweight include nearly all the important diseases of adult life, particularly those related to the arteries, heart, and kidneys. High blood pressure, for instance, is over two and a half times as common among over-weights as among average weights. The death rate of over-weights from heart disease and cerebral haemorrhage is one and a half times that of average weights, and nearly twice as high as that of under-weights. Again, Bright's disease of the kidneys exacts a death rate among over-weights nearly twice as high as that of under-weights. In diabetes the ratio is even higher.

A Special Warning

A special note of warning to those around the fifty mark. They should be closely on guard against the physical disabilities associated with later life. Fortunately, medical science offers new hope to men and women of fifty. They need not necessarily accept the possibility of heart trouble, kidney disease, or high blood pressure. These complaints can be avoided. The main requirement is that you consult your doctor while you are well, and follow this up with physical examinations at intervals.

Work wisely, eat wisely, and see your doctor regularly is a good recipe for living happily ever after.

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To clean cork dinner mats easily, rub with a little methylated spirit on a clean cloth. This is easier, and quicker than scrubbing in hot soapy water, and far more efficient for the dirty marks.

* * *

If you cut your finger do not put it under clear, running water while it is still bleeding. Bathe immediately in a mixture of half kerosene and half warm water. This closes the wound, stops the bleeding, and is not painful.

When you are making "seedy" jam, such as strawberry or raspberry, remove the jam from the heat when it has boiled for the required time, and stir vigorously for ten minutes before bottling. This makes the jam set better, and ensures an even distribution of the seeds.

* * *

Do not place bottles of jam tightly in a cupboard. The jam will keep better if there is a space between the bottles for the air to circulate round them.

* * *

To make your gravies smooth, mix the flour and liquid together with an egg whisk instead of a spoon.

THE Good Neighbour

BY MARY

From Me To You

HOW I wished I possessed the magic powers of a fairy godmother! I suppose there are times when we all wish we had some special power to do something we want to do very much indeed, and this is one of those times for me. Just at this very moment I wish I had the power to let each one of you have a glimpse of some very happy event that is going to take place in the future—I don't know what your choice would be, indeed I wonder if you would be allowed a choice, for the future is often something which chooses for us. But I would wish for you a glimpse of something very precious that is still locked in the mystery of the future, so that you could carry with you through these days the memory of an event that is yet to be. Only, if it hasn't happened, I don't suppose we could call it a memory yet, could we? Memories are some of the sweetest things we have in this life, yet there is usually a tinge of regret about them—they were good old days you think, and you smile a little as you remember some glad time in the past, then you add a little sigh for the day that is done.

Why not try a change? Instead of thinking too much about the past, cast your thoughts to the future. "Susannah" has the right idea. Let me share a piece of her letter with you, just to illustrate what I mean. She writes: "Do we women realise what a great part we can and do play in life today? One hears little or no complaint from mothers whose sons are far away—all one hears is 'When the lads come home I'll do this or that,' and somehow I feel that that brave spirit must help our boys to carry on. There we have the shaping of a new order in our hands, and I want to see a world where want and poverty are unknown, and where each child has his or her rightful place in this beautiful world. How time flies! Next year I shall have been in New Zealand 45 years. I was to stay five years, and then return to see the old home, but I had no desire to return, and although I would have loved to see my people, I love New Zealand and have no wish to leave it. Some of the lads we know called on my dear mother, and had a royal time talking to her of our doings, and listening to her tales of my childhood days. I wonder if the sons of many of our readers have visited their grandparents in England, Scotland or Wales during their stay overseas? It would be interesting to hear about these visits."

And the latter part of "Susannah's" letter brings to mind another idea I have for you. So many of us have received interesting and unique gifts from our folks overseas—amongst my collections of treasures I have a small trinket box made from olive wood of Jerusalem. It is a precious souvenir from a very dear friend in the Middle East. And I know many of you have other treasures—next time you are writing do tell us of them, where they came from, and anything else interesting about either the gifts or the givers. Let's make our next mail-bag an overseas one—tell us about the doings of your boys and girls overseas, where they are, and what they tell you. It has been the chance of a lifetime for a lot of them, and what grand tales they will have to share with us when they return! Perhaps that is the memory YOU are living for—the memory of the day on which your loved ones return home? Well, whatever the day may be, look forward to it, and work for it, so that tomorrow will be a better day than today.

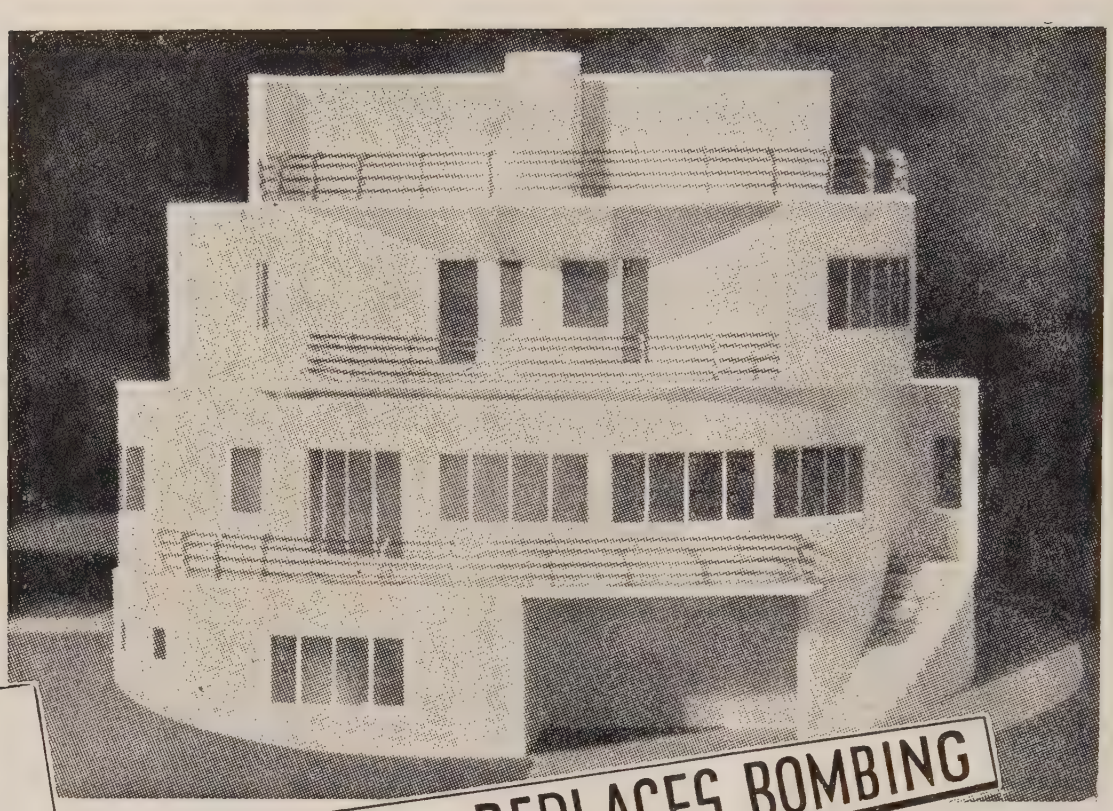
From America this Christmas I received an unusual card. The season's greetings were printed on a small piece of blue celluloid, and here is what it said: "There are but few on earth free from cares, none but carry burdens of sorrow, and if all were asked to make a package of their troubles and throw this package on a common pile, and then were asked to go and choose a package which they were willing to bear, all would select their own packages again. Your heartaches may be great, burdens heavy, but look about you, and with whom would you change?"

A stimulating and refreshing thought, isn't it? Remember it next time your troubles seem a little heavier than usual.

Mary

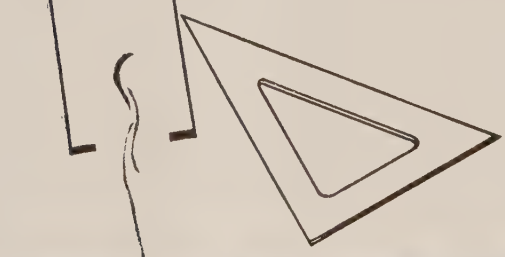
SYMPATHY

There is starlight through the shadows
for the feet that have to tread
In the path of secret sorrow with the
hidden tears unshed;
There's a glory of the sunset flaming red
down in the west
When the storm is hushed to stillness and
the waters sink to rest.
There's a lamp that God has lighted
where the shadowed pathways are
And it sheds a softened radiance, like
the shining of a star;
There's a haven of sweet refuge from the
deeply hidden pain
When the heart that long has suffered
sees God's rainbow through the rain.
There's an angel in the shadows, oft times
in human guise,
Who in silent understanding sees the
tears that blind our eyes,
For the words may be unspoken, quiet
waters running deep,
When the sympathy of friendship is outpoured on those who weep.
There's a twilight in the evening when
the throb of pain is stilled,
And the heart through human friendship
with the peace of God is filled,
And the twilight touches softly all the
valley we have trod,
When a friend's true love sustains us like
an angel sent from God.

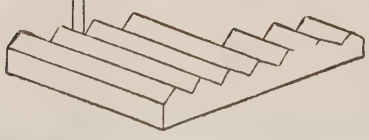


WHEN BUILDING REPLACES BOMBING

When the war is won, a brave new world will arise from the ashes of the old, and with it many good things will be restored to us. Among them will be Onehunga Blankets, available again in plenty. If you cannot buy Onehunga Blankets to-day, remember that the needs of the forces come first, and that Onehunga Blankets are one of the good things worth waiting for in our world of to-morrow.



ONEHUNGA



ONEHUNGA BLANKETS—AIR CELL BLANKETS — ONEHUNGA TRAVEL RUGS — ONEHUNGA WOOLLENS.

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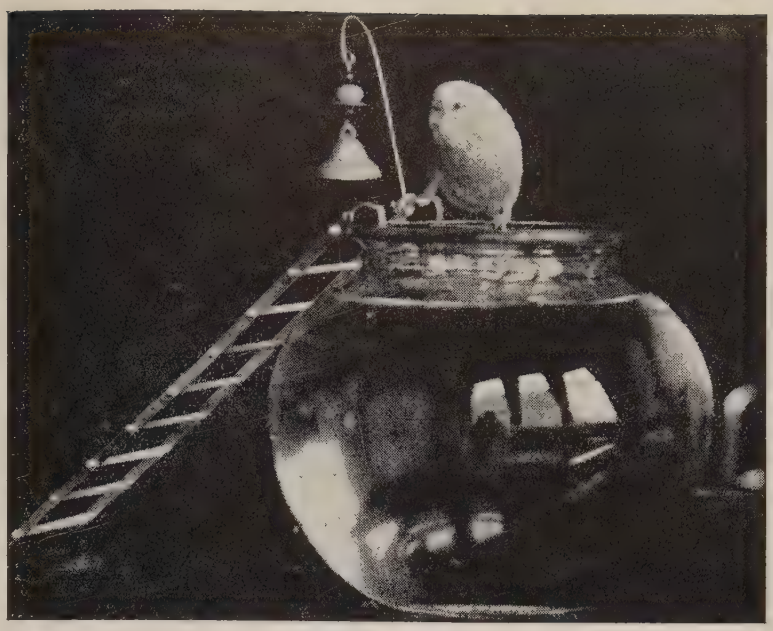
"OUR PETS"



HOW do you like our photo of the budgie on the goldfish bowl? This budgie hasn't been written about in our competition, but his photo was specially taken for you, and how I wish you could see him in colour! He is a darling, and the very treasured pet of some friends of mine. He is very tame, and most talkative too! As for the goldfishes, they don't seem to object to being observed now and then by their bird companion, for they are all on very good terms.

Now for your results. What fun I had reading all the entries, and I do think that the number of entries I received was indeed a grand tribute to our pets. As "Tussock" wrote: "Pets save us from ourselves." Now first prize goes to Dunedin, to "Gerrie Mac," with "Brynmawr," of Aramoho, a very close second. I am indeed sorry that I cannot find room to print many more of these entries, for they were all a delight to me.

First Prize:

AS I sit down to write, and look back over the menagerie of pets we had as children, I wonder and I marvel at the patience of our parents. Just as some children collect stamps, we collected waifs and strays of animal and bird family, and brought them home.

My first recollection of our pets was a wild kitten which was caught on the sandhills and brought home. We christened the kitten Tom and he periodically presented us with a batch of kittens, much to our delight! Then we had a penguin, also caught on the beach. He followed us round like a terrier. I really forget what we fed him on, but the bees resented his presence and stung him, so back to the ocean we took him. Then we had two guinea pigs given us, and before long we had dozens of guinea pigs! We kept giving them away to all our friends, but still they came, and as no one knew which was the mother and which was the father we sold the batch to a bird shop.

Then there was a homing pigeon, which proved a source of revenue to a small brother. He was told to get rid of Old Jock, as we called him, as he persisted in digging out the vegetable seeds, so he sold him, but Old Jock came back, so he sold him again, and back he came once more, but this time he brought a wife with him, and proceeded to set up home and hatch out a family. He left the garden alone for a while—he was so busy courting and making an impression on his good wife. He would climb up on the chimney pot and do stunts, rolls and tumbles, and puff himself up until we thought he would burst. Then my sister had a ferret, but this got out and killed a neighbour's hens, so the neighbour got rid of him first and asked questions after.

Another brother brought home some Muscovy ducks, and he said, "Now whatever you do, don't let them get into the water." This was too much for my sister and I. We could not believe that ducks could not swim, so we filled up a big tub of water and put the ducks in, and down "plop" right to the bottom went those ducks. They simply didn't know what their feet were for, and did we have a picnic trying to get those ducks back to normal before brother arrived on the scene? Their tails were down and their feathers stuck together. We dried them, and trotted them round and round until they perked up a bit, or I am sure they would have laid down and died. "Of all the sillies," my brother said. . . The ducks were very human. When one got hurt the others carried water in their bills and dropped it on the sick one's head, and laid grass where he could reach it. I could go on for hours, as I see lambs and birds, hedgehogs, fish, dogs, and cats all in a long row in front of me, all with their very human traits, and from each one we learned something.—**Gerrie Mac, Dunedin.**

Second Prize:

WHAT an accumulation of pets one collects on a farm. There is the "here-today-and-gone-tomorrow" kind which the children bring home—a stray hedgehog, caterpillars in a tin, a bird with a broken wing. Then there is the pet lamb. No farm seems complete without its pet lamb. Little Orphan Annie is Miss Seven's special care. She no longer looks a lonely little orphan as she gambols around the paddock kicking up her heels and making us all feel skittish too. Like Mary's little lamb of the nursery rhyme, she frequently follows them to school, and makes them late through having to shoo her home again. Then there is Goldie, a beautiful tortoiseshell cat. Even her eyes are gold, a lovely topaz. Visitors exclaim, "Oh, what a lovely pussy!" Goldie recently had a family, three golden kittens like herself. A surfeit of anything, even gold is not desirable, so the stage was all set for the disposal of the kittens, even to half a brick in a bag. At a critical moment, however, just before gathering up the kittens in preparation for their watery grave, word came that all three had been ordered by some of Goldie's admirers, so all unknown to them the kittens have much to be thankful for. Then there are the budgies, a green and a blue, who really don't earn their keep. One thinks of budgies as chattery little birds sitting on one's shoulder and generally making themselves friendly. Being quite old when we got them though, ours are merely there to be looked at, and except for an occasional twitter which we can hear any day from any sparrow, they just sit and consume bird seed.

Then there is Micky. I must tell you about him. Micky is a young opossum we rescued when its mother was caught in a trap. Elizabeth thought it was the most marvellous pet she had ever had, as she brought it in snuggling in the crook of her arm. It seemed to be just made for cuddling. As a trapeze artist it had the family in gales of laughter, but as the curtains began to suffer, a cage was hastily constructed from a butter case, a square of wire, and four of Mrs. Potts's irons. Micky had no objection to his unusual quarters, and curled up and went off to sleep. Except for occasional periods of freedom, the cage remained Mickey's headquarters until he grew out of it. One evening Micky escaped, and a very tearful Elizabeth retired to bed because he could not be found. About three o'clock in the morning a delighted little girl woke me up exclaiming, "I've found him mummy! He crawled into bed alongside of me!" I am sure I would have been scared out of my wits had I found a furry object alongside of me in the middle of the night, but not so Elizabeth. Uncle and Auntie came one day, and Uncle took a great fancy to Micky. The feeling was mutual apparently, for Micky snuggled in Uncle's pocket. Uncle had a disused aviary, and as Micky's sleeping quarters were getting somewhat cramped for him, he offered to have him transferred. It was a great wrench for Elizabeth, but as she would see him frequently she finally consented, and still looked on him as her pet. Micky is let out every night, and after a few trapeze acts up the trees and on Auntie's curtain rods and window fastenings, he settles down to his supper of a saucer of milk, and piece of apple. If he finishes his apple first he jumps up on Auntie's shoulder, and takes the last piece out of her mouth. And now has come the culminating act in Mickey's career, we will have to have another christening—Mickey has just had a baby.—**Brynmawr, Aramoho.**

I HAVE only one special pet which is a blue budgie named Billy. He is very amusing, and a very talkative little bird, for he says all sorts of things. One of his favourites is the nursery rhyme "Little Jack Horner," of which he says the first three lines. He also has a special little whistle which I taught him. He has a bell in his cage, and when he is shut up there he puts it on his head, and says, "Billy's got his hat on," and how comical he looks with it on the side of his head too! If we let him out on the table when we are playing Ludo or Snakes and Ladders he hops over and takes our markers away, and we have quite a job getting them back too.—**Norma, Masterton.**

YES, Mary, what a grand opportunity to keep pets when one lives in the country. As I write, my mind goes back to the numerous pets that we have had. First there was Cocky, our dear old cockatoo. How good it was to hear him chatting and laughing away to himself, and wasn't he fond of peanuts and bread with just that tiny piece of butter and honey spread on them. Then came Terry, our fox terrier, and what a grand companion he made. How often I am reminded of the time I had a white cat, Snowy. He was given to me as a kitten, and I had trained him to lie in my doll's pram, and be taken for walks. Weren't people surprised when they saw Snowy sound asleep amidst the small cushions that I had for him, instead of the customary doll! He certainly became well known. At the moment I have a young black kitten playing around the table leg, and keeping a watchful eye on my miniature Pomeranian. These are just a few, not to mention our birds, cats, lambs, etc. What would a home be like without some pets?—**Kahikatea, Marton.**

MY pets are rather unusual, Mary—indeed, I don't know whether I should really call them pets. Living on a farm we have so many pets, and I love them all, but I think that the ones which I am going to tell you about are the most interesting. They are monarch butterflies!

Competitions

February:

How keenly I am looking forward to receiving your entries for this competition, which closes on March 15th. Forgotten the subject? Why, surely not! For it was "Love Your Neighbours," and I want to hear just what you are doing today to help towards winning the war, remembering that it is the small things that count in the long run.

March:

Winter days are approaching again, and that means long days indoors with the children home perhaps—certainly you are fortunate if you don't strike a few wet days amongst the holidays now and then anyway. So I suggest that this month we share our ideas on wet-day entertainment for our kiddies. I am sure that your ideas will be welcomed by other mothers, so send them in.

"KEEPING THEM AMUSED ON WET DAYS."

This competition is closing on April 15th, so send your entries to me before then. Two prizes: first of 10/- and second of 5/-.

"MARY,"
C/o "Journal of Agriculture,"
P.O. Box 3004,
Wellington.

Summery! Mary Howard's sombrero in natural straw that ties under the chin with netting in bright red. The Metro-Goldwyn-Mayer actress wears the chapeau to top a peasant play-dress.

Three years ago I obtained some swan plant seed, and they have grown into strong healthy plants, above five feet tall. Last year no butterflies visited them, and as the monarchs are reported to be rare this year, I was surprised and delighted to see a beautiful one settling on one of the swan plants about a fortnight ago. I crept out and watched it fluttering gracefully about the garden, anxious lest I should frighten it away by approaching it too closely at first. By the end of the day another had joined it, and they soon grew used to my presence in the garden. They frequently flew very near to me, and allowed me to come as close as I wished to them without any fear. After three days of happiness for all concerned they vanished from our garden, and I have not seen them since, but they left dozens of tiny butterfly eggs on the plants. How anxiously I watched those eggs, until exactly a week after the butterflies first appeared I saw caterpillar number one eating his first little hole. They all hatched quickly after that, and ate and grew, and grew and ate. They are still doing the same as I write, and how fat the little things are! I love watching their striped bodies looping and curling, and I hope that soon each little caterpillar will turn into a beautiful green, gold-spotted chrysalis, and then the final transformation—the lovely butterflies themselves.

Do you call them pets, Mary? I have watched them with as much interest as I have watched my various dogs, cats, and other pets, and as I mentioned before the first butterflies became quite tame.—**Moonshine, Papakura.**

HANDY HINTS for PRESERVING FRUIT and VEGETABLES

IN time of war the housewife has an added responsibility in providing the right food for her family under conditions that have been altered through transport restrictions and economic pressure. In this present harvesting season she will contribute greatly to the war effort by preparing to supply her household with necessary fruits and vegetables throughout the year with as little use as possible of commercially preserved supplies. These supplies, now limited almost entirely to New Zealand produce, are required for export to our soldiers going overseas. Also there is a need for both economic and humane reasons to build up a reserve of food ready for export to less fortunate countries as soon as transport is available.

The January issue of the "Journal" featured recipes for home preservation of foods in the form of jam and of bottled fruit and vegetables. We now wish to supplement this with simple directions for other methods of storing food as it becomes available. The whole year's supply of garden produce should be provided for by using first the crops in season, then those fruits and vegetables which can be stored in their natural form for varying periods. This will carry one on well into winter before it becomes necessary to use what has been dried or bottled. We deal here with simple storage, drying and salting methods.

A. FRUIT.

STORING. The main points to be noted in storing fruits are: (a) that the fruit should be in good condition, i.e., free from cuts, cracks, bruises, or other skin injuries; (b) of sufficient ripeness according to species, but not over-ripe; (c) that the storage space selected should be of suitable temperature and moisture and protected from animals. It is desirable also that the fruit or vegetables should be so placed that it can be periodically inspected.

APPLES. Medium sized fruit, fully grown, but not in eating-ripe condition, is best for storing.

VARIETY. Sturmer and Tasma are good-keeping varieties, but a special precaution, noted below, is recommended to prevent shrivelling of the Sturmer. Statesman, Rome Beauty, Ballarat, Lord Wolseley and Washington varieties will hold fairly satisfactorily, provided they are not too ripe when put into storage. Cox's Orange, Jonathan and Delicious have usually a relatively short life, after which they become unpleasantly soft and mealy. The Granny Smith is not recommended for long storage under domestic conditions because it becomes subject to a brown discoloration of the skin and to a spotty kind of rot that quickly renders the fruit unfit for use.

TYPE OF STORAGE SPACE. The coldest possible place should be selected, as it must be kept in mind that the ideal storage temperatures for most varieties of apples lie between 30 deg. F. and 38 deg. F. A basement cellar, shed, or store-room will generally afford the most suitable type of accommodation. Shaded positions out-of-doors can also be very satisfactory if well shielded from winds, and if steps are taken to protect the fruit from rats and mice. It has sometimes been said that apples can be kept under a covering of straw, but this is not satisfactory, as the straw imparts a taint to the fruit.

METHOD OF STORING. Apples can be kept in heaps on an earth or concrete floor or on a shelf, but it is more hygienic and satisfactory to store them in clean wooden boxes of about a bushel capacity. If old fruit-cases are used, care must be taken to see that they have not been contaminated by previously rotting fruit. Open-sided boxes of the banana-crate type are not recommended, as they allow too much air movement round the fruit and thus permit shrivelling to take place. Individual apples need not be wrapped, but a lining of old newspaper placed round the whole of the inside of the box and folded over the top of the uppermost apples helps to maintain firm condition in the fruit.

The apples are kept a little below the level of the top of the box so that cases can be stacked one on another without causing fruit injury, and a lid should be nailed on to the top box of the stack.

With the Sturmer variety, which is very prone to shrivelling, it is recommended that the case lining be not newsprint but a fairly heavy grade of waxed paper, as this material has been found to check the loss of moisture from the fruit fairly effectively. The parchment type of paper, generally known as "greaseproof," is not suitable. The use of waxed paper cannot yet be recommended where large quantities of fruit have to be kept, but in small stacks of 10 or 20 cases it achieves its purpose without introducing other complications.

PEARS.

Pears really require a temperature of about 30 deg. F. for their proper keeping, so cannot be recommended for domestic storage for any length of time. A small quantity can be held for perhaps a week or two under similar conditions to apples, fruits being withdrawn for use the moment they show signs of ripening. It is suggested that processing (drying) rather than storage offers the best method of utilising pears under home conditions.

CITRUS FRUITS.

If lemons are gathered from one's own trees they should be cut before they are yellow, i.e., at the "silver-green" stage, with about half an inch of stalk attached. This should be cut closer before packing so that the other fruit will not be scratched.

Lemons may then be stacked in an ordinary fruit-case with a sack over the top and cured in a shady moderate temperature (70 deg. is the best temperature) with free ventilation round the case. Extreme care in handling and a constant watch for mould are the chief precautions to be taken. Wrapping in paper lessens the risk of damage, but makes inspection more difficult.

Oranges are best ripened on the trees.

For holding citrus fruit a cool but dry air is needed.

Care must be taken that no foods liable to absorb odour, e.g., butter, milk, meat, etc., are kept near citrus fruit.

For use in marmalade, grape-fruit should be picked before it is ripe, as the acid content is better for jellying.

DRYING OF FRUIT.

GENERAL. All fruits rich in sugar can be successfully dried, though home-drying is tedious with some fruits.

Drying can be carried out by using domestic cooking appliances, either on trays made of wire-gauze, perforated zinc, fine wire-netting, wooden slats, etc., placed in an oven, or in an inverted open box fitted with such traps and placed on or above the stove. If placed on the stove a wooden box must have asbestos or bricks to insulate it. The box must have ventilation at the top to allow moisture to escape and the front side should be hinged to allow inspection. In oven drying the door of the oven must be left partly

open. Trays, especially those made of metal, should be covered with cheese cloth, and this if new, must have the dressing removed to prevent scorching.

The highest temperature should be 140-150 deg. F. Quick drying at an even temperature is best, but it can be done successfully by using the oven at times when it has partly cooled after cooking.

SUN-DRYING in warm climates is also possible. A glassed-in sun porch or greenhouse makes a good drying room. Slatted wooden frames or cloths on frames raised above the ground can be used. For sun-drying it is essential to cover the fruit with cheese cloth supported a few inches above it as a protection against dust and insects.

It is possible to combine both forms of drying as occasion serves.

SULPHURING. Discoloration can be checked by sulphuring, and to a less degree by immersing peeled or prepared fruit for one minute in salted water (1 oz. salt to 1 gallon water).

Sulphuring can easily be carried out if the fruit is placed in a specially fitted drying box, as described above, by burning sulphur on a tin lid beneath the inverted box.

Another method, which is more suitable if the fruit is to be dried on separate trays is to invert empty wide-mouthed jars over sulphur fumes, one at a time, then turn the jars upright and close with a tight lid. Into these jars containing the fumes the fruit is then dropped, and the jar closed down for the time specified for each variety of fruit.

Besides preventing discoloration sulphuring helps to preserve the fruit.

To dry **APPLES** use firm ripe fruit. Peel, core, and cut into slices ½in. to ¼in. thick. Sulphur for fifteen to twenty minutes, and then spread in thin layers on the trays. If temperature is held continuously at about 140-150 deg. F. the slices should dry in four to six hours. It is desirable to turn once or twice during the process. When fully dried the pieces should have the texture of chamois leather and should not stick when pressed together. Leave in a cool room for at least twelve hours before storing in a dry place. Gravenstein's, Dunn's, Sturmer and Statesman are all good varieties for drying.

PEARS. Peel the fruit and cut in halves, quarters or slices. Use salting method to lessen discoloration. Sulphuring is apt to spoil the flavour of pears, though without it there will be discoloration.

Begin drying at 110 deg. F. and gradually increase to 145-150 deg. F. Fruit in slices requires four to six hours' continuous drying.

STONE FRUIT. These should be ripe but firm. They should be halved and stoned, also peeled as desired. Peaches require three hours' sulphuring and apricots one hour. Drying takes at least thirty hours at a temperature not above 145 deg. In most cases it is better in this country to preserve stone fruit by bottling.

TOMATOES. Peel by dipping in hot water, cut in thin slices. Sulphuring improves the colour but is not essential. The slices when dry should be crisp and can be powdered and used for soup.

It is easier to preserve tomatoes as puree in bottles.

B. VEGETABLES.

POTATOES. This crop may be stored in a dark, dry, cool cellar or shed. If the shed is light, cover the heap of potatoes with straw or sacks, and if the floor is damp store in boxes or on boards supported on bricks. They must be examined frequently for sprouting or decay. Dusting with lime, charcoal or sulphur prevents the spread of decay to sound tubers.

CARROTS. Mature crops are best lifted in late autumn and stored in sand or on the floor in a cool dark shed. They may also be stored in a heap out-of-doors on well-drained ground. Here they should be covered with a sack or straw with a thick coating of soil on top.

TURNIPS AND SWEDES can be kept for months in a shed or dry cellar by placing the roots in heaps after cutting off the tops and covering with straw. Young shoots in spring, if blanched, may be used like sea-kale.

PARSNIPS are best left in the ground, at any rate until frosty weather. They can be stored like carrots.

ONIONS for long keeping should be well harvested. The tops should not be cut but should wither naturally and close to the top of the onion. The onions when pulled should be well sun-baked. For keeping they should be plaited into strings, or put into string nets and hung in a dry airy place.

HERBS for drying should be gathered on a fine day and hung head down in bunches in a shady windy spot.

Parsley keeps its colour better if placed for one minute in a hot oven before wind-drying.

Forget the Past

MENTAL health and happiness can only be attained if the past is shut out. Petty irritations, humiliations, real or fancied, trivial mistakes and disappointments, painful memories, must all be shed each night like our clothes.

Human beings are the product of the past, and experience must leave its mark, but the golden present is only hampered and frustrated by conscientious reflection on what has gone by. Doubt handicaps life's activities, and will-power becomes weakened. Thoughts even of past happiness too can endanger the harmony of the present. There is nothing to be gained in harping unduly on "the good old days."

The vision should be allowed to wander backward, and the floodgates of memory permitted to open only on rare occasions. If there is no other influence from recollection of the past, the future will shape itself.

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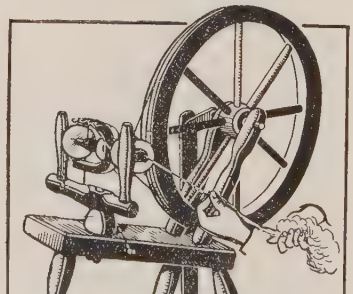

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"I Wrote a Letter To My Love"

AND you all know how the old rhyme finishes, don't you? Only I hope when you write a letter to your love you are not careless enough to drop it on the way to the post. Because especially these days when you are writing to the boys overseas letters are so precious. Have you ever paused in your letterwriting activities to think of the thrill that the boys must experience when a mail comes in from home? Let's talk about letterwriting for a while.

First of all there are those letters that we all love writing—love letters. I have been delving lately in a delightful book entitled "A Treasury of the World's Great Letters." It is edited by M. Lincoln Schuster, and I am sure that you would all enjoy it as much as I am doing. It contains letters written by all people through the ages, and amongst others it has many exquisite love letters. Here is a delightful piece from a letter from Heloise to Abelard, written as long ago as 1116. These two immortal lovers, the one an abbess of her convent, and the other a founder of a monastery, kept their love alive through their letters. It was all they had.

"What cannot letters inspire? They have souls; they can speak; they have in them all that force which expresses the transports of the heart; they have all the fire of our passions. They can raise them as much as if the persons themselves were present. They have all the tenderness and delicacy of speech, and sometimes even a boldness of expression beyond it. Letters were first invented for consoling such solitary wretches as myself! . . . . Having lost the substantial pleasures of seeing and possessing you, I shall in some measure compensate this loss by the satisfaction I shall find in your writing. There I shall read your most sacred thoughts."

From love letters let us turn our thoughts to letters written to members of the family, and dear friends, too, come in this category. How do you go about writing to them? I would suggest that you keep a pad handy, and jot down a few lines whenever you have a minute or two to spare. In this way the letter almost takes on the form of a diary, and small events are included that would otherwise be overlooked if you left your letterwriting until it took all one evening. It is the small things that make letters interesting—the boys always love to hear about the farm, how the work is progressing, and who is doing it, and how are the pets? In relating bigger events sometimes these small personal bits are left out, and how they make a letter when they are included only the recipient, hundreds of miles away, and perhaps a little homesick too, reals. Make your letters chatty, and add a dash of humour here and there.

How do you fare when you have to answer an invitation to a wedding? So many folks are puzzled over this, but there's nothing to it. Remember always to write in the third person, and you won't go far wrong. For instance, if you are answering a wedding invitation go about it like this:

"Mrs. A. has much pleasure in accepting the invitation of Mr. and Mrs. B. to the wedding of their daughter, to be held on March 18th in St. James' Church, and afterwards at a reception at 117 Harris Street."

If on the other hand you find that you are unable to attend the function, it is always more courteous to give some reason for your refusal. Like this:—

"Mrs. A. regrets that absence from town prevents her from accepting Mrs. B.'s kind invitation for March 18th."

And another important point in answering invitations—always be prompt with your reply. So much depends upon replies when catering, etc., has to be arranged.

So we come to perhaps the most difficult letter of all, and that is a letter of sympathy. In times of bereavement letters and words seem so inadequate to the writer as a medium for conveying loving sympathy to our friends in their time of trouble, and yet to those who have lost a dear one these letters of condolence are very precious. Unless you are on very intimate terms with the bereaved family, the letter need not be long—after all it is the thought of remembrance that is so welcome.

"It is with deepest sorrow that I send to you and your family my sincere sympathy in your sad bereavement," is an opening for you, and you will not find it difficult to carry on once you have started. And as with an answer to an invitation, always send your sympathies promptly, for a letter received late may often deeply upset those who are doing their best to smile again.

If you are answering an advertisement for a position, always be sure to do it in your own handwriting, for prospective employers often judge applicants on their handwriting. The length of a dash, the thickness of a stroke, the care or haste in the written expression of one's letters, these are all matters which count.

Remember then, the next time you take up your pen to write a letter, that letters are one of the greatest gifts from friend to friend, and so make your letters a lasting reflection of your own thoughts and character. So much is revealed in letters, and friends are quick to read between the lines. Make your letters worthwhile—if you feel you want to write a letter in anger, one you may regret, write it by all means, but leave it in your desk, and twenty-four hours later you will be very thankful that the letter is still in your possession. Tear it into little pieces, and write it again, if you still feel you want to.

"Letters are lamps, they send a ray
To light the spirit, and reveal
Not only what we do and say
But what we really think and feel.
You said so little—but today
I have your letter—'tis a key
Which opens wide a long-locked door
To show me all your love for me."

MY LETTER FRIEND.

I know you by your letters. One or two
Small sheets of paper, worn with being read,
Laid in a box and tied with silver thread
Are all I have of you.

What are you like? I try to read you through
The lines of characters your fingers trace.
Will my soul look on your soul, see its grace
In Heaven, and know it you?

Why long to see you? Far more truly true
Your letters show you, far more nearly near
Than p'raps your nearest know you. Dear, my dear,
I know the best of you.

Your Medicine Chest

HOW often do you spring clean your medicine chest? I hope you do it more often than once a year, for it is most essential that its contents be kept fresh, and ready for use in any emergency. So many of us have a cupboard into which we put what is left of the bottle of tonic we were using, or the end of a bottle of peroxide perhaps, and just forget it until the next time it is wanted in a hurry. And the chances are ten to one that when they are needed, those medicines you want most have deteriorated, and are useless.

First of all, where do you keep your medicine chest? In most homes it seems that a cupboard in the bathroom serves the purpose, and no place could be worse, for the temperature in this room is always varying, and clouds of steam are not too good for medicines. Actually this moist atmosphere is the **worst** place in the house for your medicine chest. Why not find a new situation? Surely there is a cool corner somewhere in your home where your medicine will have a better chance of keeping well? A dry, cold place is the best place to choose, and make very sure that it is out of reach of youngsters too.

What does your medicine chest contain? First look into it right now will probably reveal many half-empty bottles, and possibly quite a number that you had forgotten existed. Some medicines do not improve on keeping, notably peroxide and iodine, and it is common sense always to buy small bottles of these two necessities, for in the long run it will avoid undue waste. Care should be taken that the corks of peroxide and ammonia bottles are replaced quickly to avoid evaporation, but do not press them in too tightly, for there is a risk of the bottle bursting from the liberation of gas. Be careful too not to expose peroxide to the light for too long at a time. And that essential medicine when winter colds are about, ammoniated tincture of quinine, is also something that requires watching, for it very soon loses its efficacy through evaporation. Paraffin oil is one medicine that does not deteriorate with age—it keeps well, and does not evaporate ever.

Patent medicines and doctor's prescriptions soon lose their efficacy if kept for too long. It is a good principle to try and always completely use bottles of this description as soon as possible, and not to store them indefinitely for the next time they are needed.

What have you in the first aid corner of your cupboard? Doubtless you will have lint and sticking plaster, but how are your bandages? So often these are used in a hurry, and not replaced. A pair of small scissors is also a good article to have handy in times of accidents, and a needle and reel of white cotton. This may sound as though you are carrying the contents of your cupboard to an extreme, but I am sure that you will agree with me that it is very difficult to lay your hands on such small necessities as needles, cotton, pins, etc., when the emergency arises. Time often counts, and it is wise to be prepared. Vaseline too deserves a corner in this part of your cupboard, for it is invaluable for burns.

Make very sure that you always have a spare bottle of aspirin tablets on hand, they are so often a good companion when headaches are around. And of course a good tin of ointment of a reliable brand is indispensable.

Go and have a look at your medicine chest now, and I'll be surprised if you don't finish up by throwing out quite a number of half-empty bottles. And if you are in doubt about whether or not a bottle should be kept, throw it out and buy a fresh bottle. It is false economy to trifle with your health, and remember it is always better to be sure than sorry.

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Mary's "At Home"

WITH the whole family coming for Christmas, I had to put my running shoes on. I papered my kitchen, ceiling and all, for the first and last time! I will do the walls again, but never another ceiling. As I stuck one end on, the other end wrapped itself lovingly around me, and just when I was in the biggest tangle, the telephone went. In the end I got desperate and cut each length in half. As the paper had a foolproof and joinproof pattern, the result is all right though.—**Biddi Jan, Redcliffs.**

HERE is the bad penny turned up again at last! Life has been pretty hectic lately, and my letter-writing has been sadly neglected. Also I had about three months with neuritis in my arms, and could hardly hold a pen, even now they go all pins and needles if I do too much at a time. We are getting in our last paddock of hay today, and I have lunch all ready to be fetched. I am glad it is a lovely day after having been very doubtful for a time.—**Plain Jane, Taupiri.**

ONE often reads about Australians being casual, but what about New Zealanders? Two seasons ago the shearers brought along their own pakeha fleeco. Although right in the midst of the work, the fleeco asked for an hour off, as he had arranged to meet his father in town to do some business. It was two hours later when he arrived back, dressed in his Sunday best, and he calmly went on with his work. Four months later we were told that during his time off he had taken unto himself a wife! I marvel that any bridegroom could be so casual about his marriage.—**Kahikatea, Marton.**

I HAVE been thinking Mary how war will reveal incidents that have been dormant over a long period. This narrative begins during the last war, when the father of the brother and sister concerned was killed at the Front. An announcement was made from a church pulpit, asking if anyone would care for two young childen until the mother was able to secure a position, and could support the children. Although they had children of their own, some friends of ours took these kiddies, a young boy and his baby sister, and cared for them. Some months passed, and the mother returned to take the boy, saying she could now support him, but not the girl, for whom she would return later. That was the last my friends saw of the mother and son, although they tried every way to locate them, but to no avail. The only conclusion they came to was that the mother had died during the influenza epidemic.

Years passed, and we come to the second year of this war, when the boy, now in the Air Force, made inquiries after his sister. He could not find her—she had grown up to use her foster-parents' name. However, through a mere coincidence his sister came to hear of his inquiries, but it was too late, for he had sailed overseas, and a few months later he was killed in an air-crash. If he had only known at

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the time of his inquiries, the town in which his sister was living was only 40 miles distant from where he was himself. His mother? Well, she had remarried, and that is all we know.—**Kahikatea, Marton.**

VIEWS do help a lot, there is much solace and strength in the green of the hills, and their incidentals. My big grudge of town life is that so few folk have a "view," the scenery from many windows and doors consisting of so much red, green or orange roof, and the soaring aerials, nothing very uplifting is there? The vista from my cottage door is rolling green lane, broken here and there with stately trees—at least a peaceful view. Harvesting is upon us, and the usual polishing will be thrust aside while I cut umpteen-dozen sandwiches, and make a boxful of pies and sausage rolls! Heigh ho, away we go once again. Such is life!—**Mrs. Vee, Hamilton.**

A Woman's Philosophy of Life

To guard my doors—yet welcome all who come;
Stick to my job—not poach on other people's;
Forget myself and soul—be priest of home,
Since roads to heaven climb stairs as well as steeples.
To live my life, and leave my children theirs,
Exacting nought that is not freely given;
To laugh at life—not think that preference shares
In gloom on earth can bring me joy in heaven.

—Jocelyn Lee.

I DID enjoy your description of the holiday spot you visited—the Sounds must be a lovely part of New Zealand from all we hear about its beauty. Like you, I love our native bush. We have ample opportunity of rambling in it here because our farm adjoins a large Government reserve. Sometimes when the children and I have had to scramble up the hills (and they are hills) for stray stock, we've just had to sit down and drink in all the loveliness of the bush, watch the birds, and enjoy the view through breaks in the trees of the blue sea out eastwards. The birds are so tame and inquisitive, too. The children have been studying them, and our native plants, and have learned many interesting things about them both. We have two native pigeons nesting very near our house in a tall tree. They show no fear, and I understand lay only one egg each year on a rickety top nest. If it doesn't fall down in a storm there is a chance of increase in this bird family, but no wonder they grew so scarce as to warrant protection.

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WOOLWORTHS AND TOILETRY COUNTERS.

"LIBERTY'S" entry in the "Milestones" competition I did so much enjoy. I do hope this brave New Zealand son comes home safely one day to her. I heard a sermon recently that gave me a new idea when thinking about the lads who have joined God's great victorious army. The preacher said: "In God's sight no one ever dies. They are always living to Him." We are told many times in various ways about that life which goes on, and we will know our loved ones again some day. I have always believed that, but still we feel that we are shut off from our dear ones for a time anyway. So this sentence, "In God's sight no one ever dies, they are always living to Him" made me see things from a new angle. Instead of seeing a break in life, as from the angle of human beings, I had a vision instead of a perfect continuance of life, emerging from one stage to another more beautiful in God's sight, endowed always with life. I think this is a helpful thought for sorrowing parents.—**Tiggetty Boo, Kati Kati.**

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